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Economic Impact of Proposed Amendments to Water Pollution Regulations, R77-12, Docket A

Harza Engineering Co., Chicago, IL

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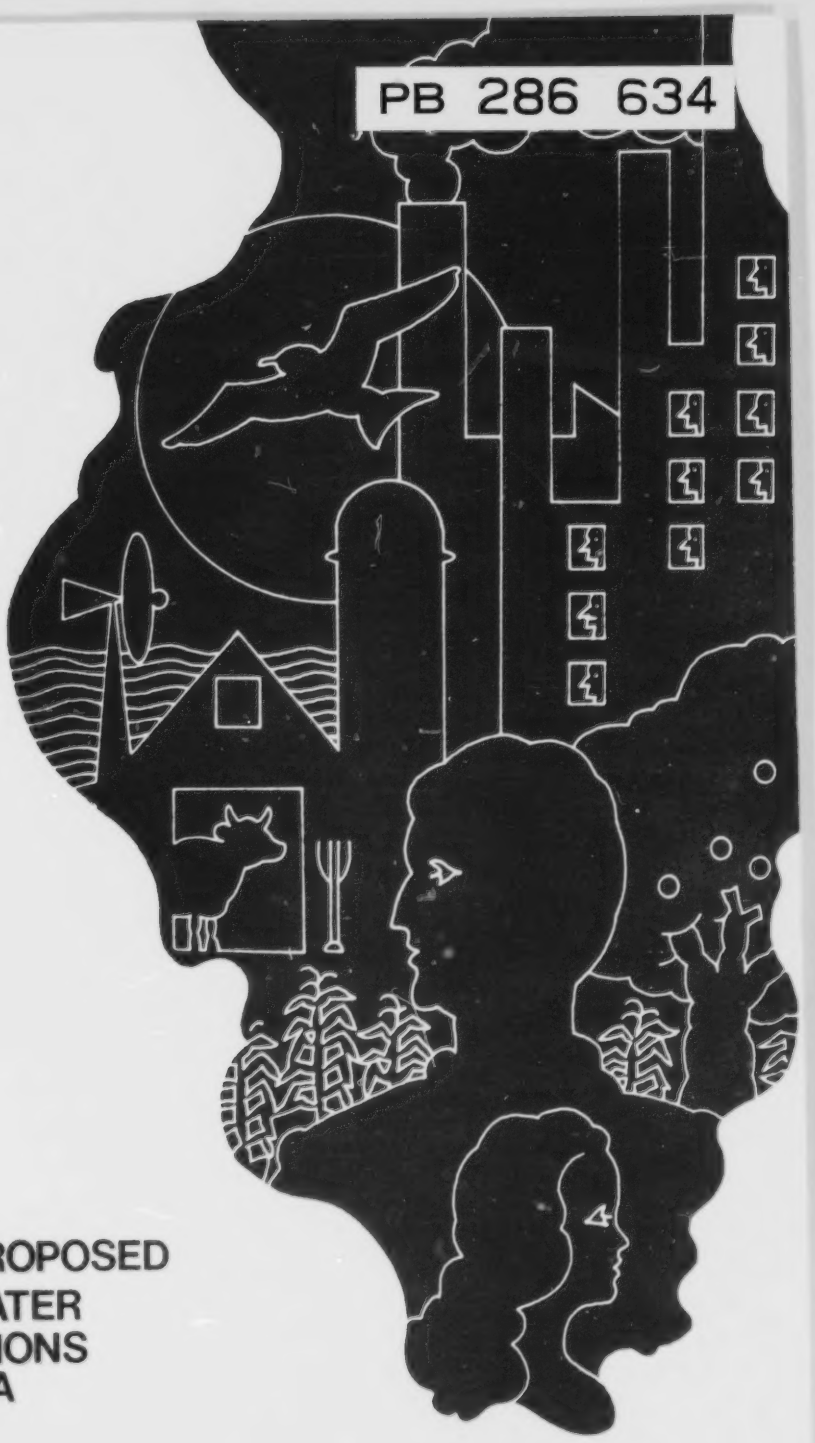

ECONOMIC IMPACT OF PROPOSED AMENDMENTS TO WATER POLLUTION REGULATIONS R77-12, DOCKET A

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The proposed amendments to the Water Pollution Regulations identified as "Docket A" of the IEPA Proposal R77-12 consist of several definition changes, the addition of a new definition, modifications to certain rules, and the addition of a new rule. To facilitate the assessment and discussion of these numerous and diverse amendments, they were grouped into five categories as listed below:

1. Sewer and Sewage Definition Changes
2. Combined Sewer Regulations Changes
3. Secondary Contact Water Quality Standard Changes
4. Dilution Ratio Definition
5. Implementation Plan Changes

These amendments and the significant benefits and costs resulting from them are summarized in this chapter.

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ECONOMIC IMPACT OF PROPOSED AMENDMENTS TO WATER POLLUTION REGULATIONS, R77-12, DOCKET A

by

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Opinion of the Economic Technical Advisory Committee of the Illinois Institute for Environmental Quality

The Economic Technical Advisory Committee has reviewed the economic impact study, IIEQ Document No. 78/23, entitled Economic Impact of Proposed Amendments to Water Pollution Regulations, R77-12, Docket A. The Committee finds the report to be generally responsive to the requirements of Section 6 of the Environmental Protection Act, and recommends that it be forwarded to the Pollution Control Board so that public economic impact hearings may be held in connection with proposed regulation R77-12, AMENDMENTS TO THE WATER POLLUTION REGULATIONS OF THE ILLINOIS POLLUTION CONTROL BOARD.

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Chapter 1

SUMMARY

The proposed amendments to the Water Pollution Regulations identified as "Docket A" of the IEPA Proposal R77-12 consist of several definition changes, the addition of a new definition, modifications to certain rules, and the addition of a new rule. To facilitate the assessment and discussion of these numerous and diverse amendments, they were grouped into five categories as listed below:

1. Sewer and Sewage Definition Changes
2. Combined Sewer Regulations Changes
3. Secondary Contact Water Quality Standard Changes
4. Dilution Ratio Definition
5. Implementation Plan Changes

These amendments and the significant benefits and costs resulting from them are summarized in this chapter.

Sewer and Sewage Definition Changes

This category includes amendments to definitions of "sewage" and "sewer". The definition of "sewage" would be changed to connote water-carried human and related wastes and would exclude land runoff, which is included in the existing definition. The definition of "sewer" would be changed to mean a conveyance system that was constructed and operated to transport wastewater or land runoff, or both. This change, by making the definition of conveyance system explicit, will further the intent of the act. The natural watercourses which receive both wastewater and runoff would be clearly excluded and will continue to be provided the same level of protection as any other waters of the state.

The amended definition of sewer would require treatment facilities discharging to natural watercourses to either

eliminate the discharges or provide treatment to meet applicable water quality standards. However, the cost of such controls should not be considered a consequence of the proposed change because such control actions have been required under the existing rules and regulations.

Combined Sewer Regulations Changes

This category includes a change in the definition of combined sewer, the addition of a definition of combined sewer service area, and an amendment to Rule 602 (a). The definition of "combined sewer" would be changed to mean a sewer that is designed and constructed to receive both wastewater and land runoff. This change would make the definition explicit and eliminate the more liberal interpretation of the existing definition. The current definition has been interpreted by several communities to allow the designation of separate sanitary sewers as combined sewers because they came to be used as such due to inflow. This change would specifically rule out such an interpretation and thus tend to eliminate litigation on such matters.

A definition of "combined sewer service area" would be added to mean a specific drainage area served by a combined sewer system. This addition and the amendment to Rule 602 (a) would allow construction, extension, and rehabilitation of a combined sewer within an existing combined sewer service area, but prohibit expansion or establishment of a new combined sewer service area. These changes would eliminate the need to acquire a variance for combined sewer construction in the existing combined sewer service areas. This would result in savings to IEPA, IPCB and the owner of the sewers. The total savings are estimated to be $14,000 annually with a major portion of it benefiting the owner of the sewers.

The construction of new combined sewers within an existing combined sewer service area is expected to prevail only in a limited area. Such construction would not add a significant flow to the existing overflows and would not have discernible adverse impacts on the receiving waters. In addition, IEPA will continue to evaluate the potential impact of all permit applications for construction of combined sewers and if a proposed construction would cause or contribute to significant adverse environmental consequences, the permit would be denied.

Secondary Contact Water Quality Standard Changes

This category includes an amendment to Rule 205(e) and the addition of Rule 205(g). Rule 205(e) would be amended to clarify the applicable standards for secondary contact waters. The new Rule 205(g) adds a limitation for toxic substances to minimize acute toxic stresses on indigenous aquatic life in secondary contact waters and minimize impacts on downstream general use waters.

The proposed standards for several chemical constituents are the same as those required by existing Rule 205(e) except for the limitations on total arsenic, total barium, and total dissolved solids. The concentrations of total arsenic, total barium and total dissolved solids (TDS) are changed to the same levels as those for general use water quality standards.

The major potential benefits from these changes are related to the ecology of these waters. Health related benefits are negligible as these waters are not intended for use as drinking water or primary contact recreation. The changes in total barium and total arsenic limitations would not result in any ecological benefits. The potential

benefit of adding limitations for toxic substances could be significant, due to their lethal action on aquatic life. The type and extent of toxic substances discharged into secondary contact waters and their impact on aquatic life are not known. The proposed standard for toxic substances would ensure that control of toxic substances can be enforced when these substances and their impacts on aquatic life are identified.

The TDS limitation would not result in significant immediate benefits. The existing aquatic life in secondary contact water consists of pollution tolerant forms and the enhancement of aquatic life in these waters is limited by existing physical and chemical conditions of the waters. The existing concentration of total dissolved solids, which occasionally exceeds the proposed limitation, does not appear to be critical in supporting and enhancing the aquatic life in secondary contact waters.

The proposed limitations of total barium and total arsenic would not result in any control cost (removal from industrial and municipal wastewater), because the effluent requirements will remain lower than the proposed water quality standard. The standards for toxic substances and total dissolved solids, however, could result in control costs. The cost for control of toxic substances will probably be incurred without this regulation as U.S. EPA is establishing effluent standards for an initial list of 65 toxic pollutants. Several industries in Cook and Will Counties use one or more of the 65 toxic pollutants designated by U.S. EPA as priority toxicants. The potential cost of controlling and monitoring these toxic pollutants cannot be assessed as the nature of these discharges and their concentrations are not known.

The concentration of TDS occasionally exceeds the proposed 1000 mg/l. Enforcement of the proposed TDS standard could result in cost to control the sources of TDS. The control of TDS in industrial and municipal discharges does not appear to be necessary as the concentration of TDS in most of these discharges is lower than the level proposed. The control of non-point sources, which appear to contribute to these occasional concentrations of over 1000 mg/l, cannot be assessed as the nature and the degree of their contribution cannot be evaluated from the existing data.

Dilution Ratio Definition

This change would allow the determination of dilution ratio to be based on the ratio of either the seven-day once in ten year low flow of the receiving stream or the lowest flow of the receiving stream when effluent discharge is expected to occur, whichever is greater, to the average flow of the treatment works for the design year. This change would allow a controlled discharge of wastewater (from treatment plants with storage facilities) to meet less stringent effluent requirements. In addition, the proposed change would also relax the effluent requirements for treatment facilities that discharge only during precipitation events.

This change has a potential for reduction in treatment cost to one industry, to owners of small domestic wastewater treatment plants, and to owners of treatment facilities for area runoff with effluent requirements based on Rule 404. A total of 105 wastewater treatment facilities, each having a design flow between 0.25 and 0.5 mgd, with stringent effluent requirements for BOD_5 and suspended solids could benefit from this change. These facilities could utilize storage

lagoons and discharge only during high flow periods. This could result in savings of up to $40 million in capital costs and $6.7 million in annual operation and maintenance cost. The actual savings would depend on the status of existing facilities and the number of treatment plants that will utilize storage lagoons. The potential savings to an industry that could use its existing facilities to control discharges are estimated to be $3 million in capital cost.

Implementation Plan Changes

This category includes the deletion of Rules 1001 and 1002, which require the IEPA to submit to the IPCB an annual report on waste discharges and the dischargers to file project completion schedules. The deletion of the annual waste report requirement would eliminate duplication of similar information available in NPDES data files, Phase I Basin Plans and 305(b) reports. It would also result in savings to IEPA, estimated to be $15,000 in initial costs and $5000 in annual costs. The compliance schedule required under Rule 1002 is now obsolete and much of this information is now included in the NPDES permits. The deletion of Rule 1002 will necessitate that Rule 602(d)(6), which contains reference to Rule 1002, be deleted or amended.

Overview of Economic Impacts

The major benefit of the proposed amendments would be to clarify the existing regulations and the intent of the Illinois Pollution Control Board Rules and Regulations. This clarification would aid in the enforcement of rules and regulations and would also result in fewer litigations. Monetary benefits would be realized as a result from the elimination of variance requirements for combined sewer construction and from less stringent effluent requirements

due to the change in the definition of dilution ratio. These savings, though significant to an individual industry, municipality, or owner of treatment works, are not significant enough to have secondary impacts on agriculture, local government, commerce or industry, employment, or cost and availability of goods and services.

The major costs of the proposed amendments would be related to the control of total dissolved solids to eliminate occasional violations of the proposed standard and to the control of toxic substances. The cost to control TDS from non-point sources cannot be assessed from the existing data for secondary contact waters. The occassional TDS concentrations which exceed 1000 mg/l do not appear to be due to point source discharges. The enforcement of the limitation on toxic substances is expected to be on a case by case basis as the nature and concentration of toxic substances and potential problems are identified.

Chapter 2

INTRODUCTION

Motivation for the Regulation

The Illinois Environmental Protection Agency (IEPA), pursuant to Section 1004 of the Illinois Environmental Protection Act (Ill. Rev. Stat., Ch. 111 1/2, Sections 1001 et seq., 1975), has petitioned the Illinois Pollution Control Board (IPCB) to amend certain parts of the Water Pollution Regulation contained in Chapter 3 of the Illinois Pollution Control Board Rules and Regulations.

The proposed amendments of "Docket A" of the IEPA Proposal R77-12 are diverse and numerous. To facilitate discussion of the proposed amendments with respect to their economic and environmental impacts they are grouped into five categories. The proposed amendments included in each category are summarized below. The rationale behind the amendments and the intended benefits are also summarized. The exact wording of the amendments and the "Justification" statement developed by the IEPA as required by Procedural Rule 203(b) of the Act are presented in Appendix A.

Sewer and Sewage Definition Changes

This category includes the definition changes of "Sewer" and "Sewage".

The definition of "sewage" would be changed to connote water-carried human and related wastes from any source. The existing definition includes land runoff but the amended definition does not.

The definition of "sewer" would be changed to mean a conveyance system that was constructed and operated for transporting wastewater or land runoff, or both. The existing

definition does not stipulate that the system must be constructed for the purpose of conveying wastewater or runoff.

The proposed changes in the definitions of "sewage" and "sewer" are designed to eliminate the ambiguity in the interpretation of existing definitions and restrict the classification of a conveyance system as a "sewer" only if it was designed for the purpose of transporting wastewater or land runoff. Natural waterways that are used to transport both wastewater and land runoff would be excluded and appropriate water quality standards would be applicable to them. This indeed has been the intent of the act and has been demonstrated in the IPCB's opinion and decision on cases before the Board e.g., Stephan Chemical vs. EPA, (PCB 74-270).

Combined Sewer Regulations Changes

This category includes changes in the definition of combined sewer and combined sewer service area, and amendments to Rule 602(a).

The definition of "combined sewer" would be changed to mean a sewer that is designed and constructed to receive both wastewater and land runoff. The existing definition designates a combined sewer as a sewer that conveys both wastewater and runoff but does not stipulate whether or not the sewer was designed for that purpose.

The amended definition of "combined sewer" would not allow the designation of a separate sanitary sewer as a combined sewer even though it came to be used as such over a period of time. In accordance with the Environmental Protection Act and Rule 602(b) of the Water Pollution Regulation, IEPA has denied requests to classify such sewers as combined sewers. Such action was taken by the IPCB in the case of Springfield District vs. EPA (PCB 75-250).

The definition of "combined sewer service area" would be added to mean a specific drainage area served entirely by a combined sewer system. Areas served by separate sewer systems that enter the combined sewer system are not included. Undeveloped areas within a combined sewer service area may be included in that area if deemed appropriate by the IEPA.

The addition of a definition of "combined sewer service area" is intended to clarify the application of amended rule 602(a).

Rule 602(a) would be amended to read "(a) The expansion of existing or establishment of new combined sewer service areas is prohibited, except where sufficient retention or treatment capacity is provided to ensure that no violation of the effluent standards in Part IV of this Chapter occurs." This amendment is intended to allow the construction of relief sewers and the replacement of existing sewers in a combined sewer service area. It is also intended to allow extension of combined sewer service to unsewered pocket areas completely surrounded by a drainage area served by an existing combined sewer system. Rehabilitation and construction of combined sewers in the existing combined sewer service areas have been allowed in the past by granting a variance from Rule 602(a).

Secondary Contact Water Quality Standard Changes

This category includes the amendments to secondary contact water quality standards by the change of Rule 205(e) and the addition of 205(g).

Rule 205(e) of Chapter 3, on quality standards for secondary contact and indigenous aquatic life waters, would be changed to read: (e) Concentrations of other chemical constituents shall not exceed the following standards:

Constituent	Storet Number	Concentration (mg/l)
Ammonia Nitrogen (as N)	00610	2.5 (April-October) 4.0 (November-March)
Arsenic (Total)	01002	1.0
Barium (Total)	01007	5.0
Cadmium (Total)	01027	0.15
Chromium (Total Hexavalent)	01032	0.3
Chromium (Total Trivalent)	01033	1.0
Copper (Total)	01042	1.0
Cyanide	00720	0.025
Fluoride (Total)	00951	15.0
Iron (Total)	01045	2.0
Iron (Dissolved)	01046	0.5
Lead (Total)	01051	0.1
Manganese (Total)	01055	1.0
Mercury (Total)	71900	0.0005
Nickel (Total)	01067	1.0
Oil (Hexane Soluble or Equivalent	00550, 00556 or 00560	15.0
Phenols	32730	0.3
Selenium (Total)	01147	1.0
Silver	01077	0.1
Zinc (Total)	01092	1.0
Total Dissolved Solids	70300	1000.0

The amendment to Rule 205 (e) is intended to provide specific numeric standards for chemical constituents, which would clarify the ambiguities in water quality standards for

secondary contact waters and would correct some discrepancies between these standards and the standards for general use waters.[1/]

Rule 205 (g) would be added and would read "(g) Any substance toxic to aquatic life not listed in Rule 205 (e) shall not exceed one half of the 96-hour median tolerance limit (96-hour TLm) for native fish or essential fish food organisms." The establishment of a standard for the limitation of toxic substances in these waters (Rule 205 (g)) is intended to minimize acute toxic stresses on indigenous aquatic life and minimize their impact on downstream general use waters.

Dilution Ratio Definition

The definition would be changed to mean the ratio of the seven-day, once-in-ten-year, low flow of the receiving stream or the lowest flow of the receiving stream when effluent discharge is expected to occur, whichever is greater, to the average flow of the treatment works for the design year. The change in the definition of "Dilution Ratio" is intended to eliminate the application of the 7 day-10 year low flow to facilities with intermittent discharges. This change in definition would also permit less stringent effluent requirements for treatment facilities that are designed to discharge only when the receiving stream flow is at least five times greater than the rate of discharge.

The proposed amendment to the definition of dilution ratio is not intended to affect the determination of dilution ratio for facilities with continuous discharge. However, it specifies average flow of the treatment works for the design year, whereas the existing definition uses average dry

1/ All waters of the State of Illinois are designated for general use except those designated as Secondary Contact and Indigenous Aquatic Life Waters.

weather flow of the treatment works for the design year to determine the dilution ratio. The deletion of "dry weather" from the existing definition could affect the dilution ratio for treament works with combined sewers. If the average flow of the treatment works with combined sewers is interpreted as average of dry and wet weather periods, this will result in lower dilution ratio than the one determined on the basis of dry weather flow only. The lower dilution ratio determined on the basis of average of dry and wet weather flows could make the effluent requirements for treatment works with combined sewers more stringent than the existing effluent requirements. Since this is not the intent of the proposed amendment, a detailed economic analysis is not considered necessary. This potential interpretation problem can be averted by clearly distinguishing the two flow conditions from the treatment works, i.e., the average flow of the treatment works with intermittent discharge and the average dry weather flow of the treatment works with continuous discharge.

Implementation Plan Changes

This category includes the changes to Rule 1001, Implementation Plan (Part X) and Rule 1002 concerning Waste Discharge Report and Project Completion Schedule, which would both be deleted under the proposed amendments. The deletion of Rule 1001 and 1002 will eliminate the requirements of an annual waste discharge report by the IEPA to the IPCB and the filing of project completion schedules by dischargers. This would eliminate the duplication of information that is available through the NPDES program.

The deletion of Rule 1002 will necessitate that Rule 602(d)(6), which contains reference to Rule 1002, be deleted

or amended. Deletion of Rule 602(d)(6) is not anticipated to have any economic impact.

Translation of Rationale into Benefit Categories

The primary reason for the proposed amendments is to clarify the existing rules and regulations so that their interpretation and enforcement can be carried out in accordance with the intent of the act.

The beneficial impacts of these amendments are generally similar to those conceived during the formulation and adoption of the Water Pollution Rules and Regulations. The significant additional benefits are as follows:

a) An addition of a definition of combined sewer service area and amendment to Rule 602(a) would result in the reduction of the administrative cost to the state and the reduction of both cost and delay to the dischargers by eliminating the need to request a variance for combined sewer construction in a combined sewer service area.

b) The clarification of the language of the act with respect to the definition of sewer, sewage, and combined sewer would result in fewer litigations and requests before the IEPA. This could result in a better adherence to the compliance schedule to meet water quality standards, thus enhancing the improvement in water quality of the state.

c) The amendment to the definition of dilution ratio would result in cost savings due to less stringent effluent requirements for intermittent and controlled discharges.

d) The elimination of Rule 1001 would result in cost savings to the IEPA.

weather flow of the treatment works for the design year to determine the dilution ratio. The deletion of "dry weather" from the existing definition could affect the dilution ratio for treament works with combined sewers. If the average flow of the treatment works with combined sewers is interpreted as average of dry and wet weather periods, this will result in lower dilution ratio than the one determined on the basis of dry weather flow only. The lower dilution ratio determined on the basis of average of dry and wet weather flows could make the effluent requirements for treatment works with combined sewers more stringent than the existing effluent requirements. Since this is not the intent of the proposed amendment, a detailed economic analysis is not considered necessary. This potential interpretation problem can be averted by clearly distinguishing the two flow conditions from the treatment works, i.e., the average flow of the treatment works with intermittent discharge and the average dry weather flow of the treatment works with continuous discharge.

Implementation Plan Changes

This category includes the changes to Rule 1001, Implementation Plan (Part X) and Rule 1002 concerning Waste Discharge Report and Project Completion Schedule, which would both be deleted under the proposed amendments. The deletion of Rule 1001 and 1002 will eliminate the requirements of an annual waste discharge report by the IEPA to the IPCB and the filing of project completion schedules by dischargers. This would eliminate the duplication of information that is available through the NPDES program.

The deletion of Rule 1002 will necessitate that Rule 602(d)(6), which contains reference to Rule 1002, be deleted

or amended. Deletion of Rule 602(d)(6) is not anticipated to have any economic impact.

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The primary reason for the proposed amendments is to clarify the existing rules and regulations so that their interpretation and enforcement can be carried out in accordance with the intent of the act.

The beneficial impacts of these amendments are generally similar to those conceived during the formulation and adoption of the Water Pollution Rules and Regulations. The significant additional benefits are as follows:

a) An addition of a definition of combined sewer service area and amendment to Rule 602(a) would result in the reduction of the administrative cost to the state and the reduction of both cost and delay to the dischargers by eliminating the need to request a variance for combined sewer construction in a combined sewer service area.

b) The clarification of the language of the act with respect to the definition of sewer, sewage, and combined sewer would result in fewer litigations and requests before the IEPA. This could result in a better adherence to the compliance schedule to meet water quality standards, thus enhancing the improvement in water quality of the state.

c) The amendment to the definition of dilution ratio would result in cost savings due to less stringent effluent requirements for intermittent and controlled discharges.

d) The elimination of Rule 1001 would result in cost savings to the JEPA.

e) The addition of a standard for toxic substances would minimize acute toxic stresses on indigenous aquatic life in secondary contact waters and minimize impact on downstream general use waters.

Significant Cost Elements

The proposed amendments to Secondary Contact Water Quality Standards would result in direct costs to the affected dischargers. The significant direct costs are as follows:

a) Potential cost to dischargers of total dissolved solids (TDS)to reduce TDS loads to secondary contact waters.

b) Treatment and monitoring costs to dischargers of toxic substances to secondary contact waters.

Chapter 3

CURRENT AND ANTICIPATED ENVIRONMENTAL CONSEQUENCES

The main intent of the proposed amendments is to clarify the existing regulations; however, an additional definition and a rule are also proposed. The environmental consequences of these amendments, for the most part, are similar to those anticipated from enforcing existing rules and regulations. This study, therefore, considers the environmental consequences of the proposed amendments that deviate from the existing rules and regulations.

Sewer and Sewage Definition Changes

The environmental benefits of the current and proposed regulations are limited to natural watercourses that transport wastewater and land runoff. Although the current regulations do not explicitly indicate that such watercourses are not sewers, IPCB has established a precedent that classifies such watercourses as "waters" of the State and not as sewers. Thus, water quality standards are applicable to natural watercourses under the existing regulations, and they will continue to be applicable under the proposed regulations. No change in environmental consequences will occur as a result of the proposed regulation.

Combined Sewer Regulations Changes

The environmental impacts of these changes are limited to the waters receiving overflows from combined sewers. The negative impacts of existing overflows will not be aggravated by the proposed changes. The construction of relief sewers and rehabilitation of existing combined sewers will not change appreciably the characteristics of combined sewer overflows. The construction of new combined sewers is

expected in very limited areas, and would not increase the overflows or have discernible impacts.

Moreover, the IEPA will continue to evaluate the potential impact of all proposed combined sewer construction within combined sewer service areas. If the proposed construction will cause or contribute to water pollution or to the violation of the Environmental Protection Act or other applicable regulations, the permit to construct such sewers will be denied.

Secondary Contact Water Quality Standard Changes

All the constituent concentrations in the proposed amendments, except total arsenic, total barium and total dissolved solids, are the same as required by the existing rules and regulations. Total arsenic and total barium concentrations are increased from the existing levels of 0.25 and 2.0 mg/l to 1.0 and 5.0 mg/l, respectively. The concentration of total dissolved solids (TDS) is limited to 1000 mg/l, the same as in the existing standard for general use waters. The existing applicable limitation for TDS is ambiguous; however, a criterion of 3500 mg/l has been used as a reference by IEPA for secondary contact waters.(1) The environmental consequences of these three changes are evaluated below.

Barium and Arsenic

Relaxing the stream standards for total barium and total arsenic will not result in stream degradation because the existing effluent standards for these two constituents are more stringent than the proposed water quality standards. The existing concentrations in secondary contact waters are significantly below the proposed standards. Maximum concentrations of these two constituent parameters in secondary

contact waters monitored by IEPA during 1976, at 26 stations, are 0.006 mg/l for total arsenic and 0.3 mg/l for total barium.

Total Dissolved Solids

The proposed limitation of TDS will not interfere with the beneficial uses of secondary contact waters. However, it is doubtful if the proposed limitation will significantly enhance the diversity of aquatic life in these waters. It also appears that the present concentrations of TDS, which occasionally exceed the proposed limitation, would not have a severe impact on the aquatic life in these waters.

The TDS concentrations in the Illinois waterways follow a regional pattern based on geological and regional point source contributions. In a study by Flemal and Nienkerk[2], the weighted average TDS concentrations were examined by region and high loadings were found in the northeastern part of the state, which includes all secondary contact waters. An analysis of TDS data by Huff and Huff[3] indicated that 77 of the 545 monitoring stations on Illinois waterways had one or more samples with a concentration exceeding 1000 mg/l. Of the 77 monitoring stations, 47 stations or 61 percent are reported to be in secondary contact waters. These high concentrations were attributed to the effects of urbanization as well as geological aspects of the area. The Des Plaines River, which flows through the metropolitan Chicago area, was reported to have the most monitoring stations with TDS concentrations above 1000 mg/l.

The 1976 IEPA monitoring data for the TDS concentrations in secondary contact waters do not indicate concentrations above 1000 mg/l, as shown in Table 1. The maximum concentration of 870 mg/l was reported for two stations on the

Calumet Sag Channel. The TDS data for the same stations shown in Table 1 monitored by IEPA during 1975, also do not indicate concentrations above 1000 mg/l. The TDS monitoring by the Metropolitan Sanitary District of Greater Chicago (MSDGC) for the same waterways, however, does indicate concentrations of TDS above 1000 mg/l. Maximum concentrations over 1000 mg/l were reported in the Chicago Sanitary and Ship Canal, and Calumet Sag Channel during 1976, as shown in Table 2. Concentrations of over 1000 mg/l were also reported during 1975 by MSDGC in the North Shore Channel, Calumet Sag Channel, and Grand Calumet River. A total of 3 stations in the above waterways had concentrations over 1000 mg/l. The differences between the two data sets appear to be due to different sampling times. The method of analysis does not account for these differences because it was the same for all samples with TDS concentrations above 750 mg/l. IEPA monitors TDS concentrations of 750 mg/l or less by electrical conductivity and converts the specific conductivity in micromhos to mg/l by using a factor of 0.6. The TDS concentrations above 750 mg/l are measured by the filterable residue method as specified in the Standard Methods for the Examination of Water and Wastewater[4]. The MSDGC measures TDS in all samples by the filterable residue method.

The TDS data for secondary contact waters also indicate variation in the concentrations from station to station for the same waterway, and also from month to month for the same station. The average TDS concentrations are generally higher in the Calumet Sag Channel, Little Calumet River and North Branch of Chicago River. The maximum TDS levels occur primarily during winter months when runoff contains salts used for de-icing.

Table 1

TOTAL DISSOLVED SOLIDS
IN SECONDARY CONTACT
WATERS DURING 1976
IEPA MONITORED STATIONS

Water Quality Station[3]	No.[1]	TDS/ES[2] (MG/L) Mean	Maximum
Chicago Sanitary and Ship Canal			
GI 1 135th St. Bridge at Romeoville	7	420	570
GI 2 Division St. Bridge at Lockport	7	430	580
GI 3 Damen Ave. Bridge	8	337	430
GI 4 Rt-50 Cicero Ave. Bridge	9	360	520
GI 5 Rt-43 Harlem Ave. Bridge	9	402	530
GI 6 Wentworth Ave. Bridge	8	415	520
GI 7 Rt-83 Bridge	9	475	640
Calumet Sag Channel			
H 1 Rt-83 Bridge N of Sag Bridge	8	541	870
H 2 Rt-50 Cicero Ave. Bridge	6	518	570
H 3 Ashland Ave. Bridge	7	574	870
Calumet River			
HAA 1 130th St. Bridge	8	315	440
HAA 2 US 41 - Ewing Ave.	8	191	210
Grand Calumet			
HA 1 Torrence Ave. Bridge	7	698	830
Little Calumet River			
H 4 Rt-1 Halstead St. Bridge	7	542	710
H 5 Indiana Ave. Bridge	6	360	450
H 6 I-94-Calumet Xway Bridge	4	458	500
HB 1* Ashland Ave. Bridge	4	555	870
HB 5* Rt-83-147th St. Bridge	3	560	960
North Shore Cannel			
HCCA 1 Linden Ave. Bridge	7	178	210
HCCA 2 Oakton St. Bridge	8	271	660
HCCA 3 Touhy Ave. Bridge	8	471	690

Table 1 (Contd.)

TOTAL DISSOLVED SOLIDS
IN SECONDARY CONTACT
WATERS DURING 1976
IEPA MONITORED STATIONS

Water Quality Station[3]	No.[1]	TDS/ES[2] (MG/L) Mean	Maximum
North and South Branch, Chicago River			
HCC 1* Kedzie Ave. Bridge	7	528	670
HCC 2 Wilson Ave. Bridge	8	502	810
HCC 3 Addison Ave. Bridge	7	474	650
HCC 4 North Ave. Bridge	8	552	880
HCC 5 Kinzie Ave. Bridge	7	461	540
HC 1 Van Buren St. Bridge	7	348	450
HCA 1 Archer Ave. Bridge	7	357	420
DesPlaines River			
G 2* 135th St. Bridge at Romeoville	7	565	820
G 3* Stephen St. Bridge at Lemont	7	578	830
G 4* Rt-83 Bridge	6	490	570
G11* Division St. Bridge	7	564	830
G12 Brandon Rd. Bridge	8	507	700

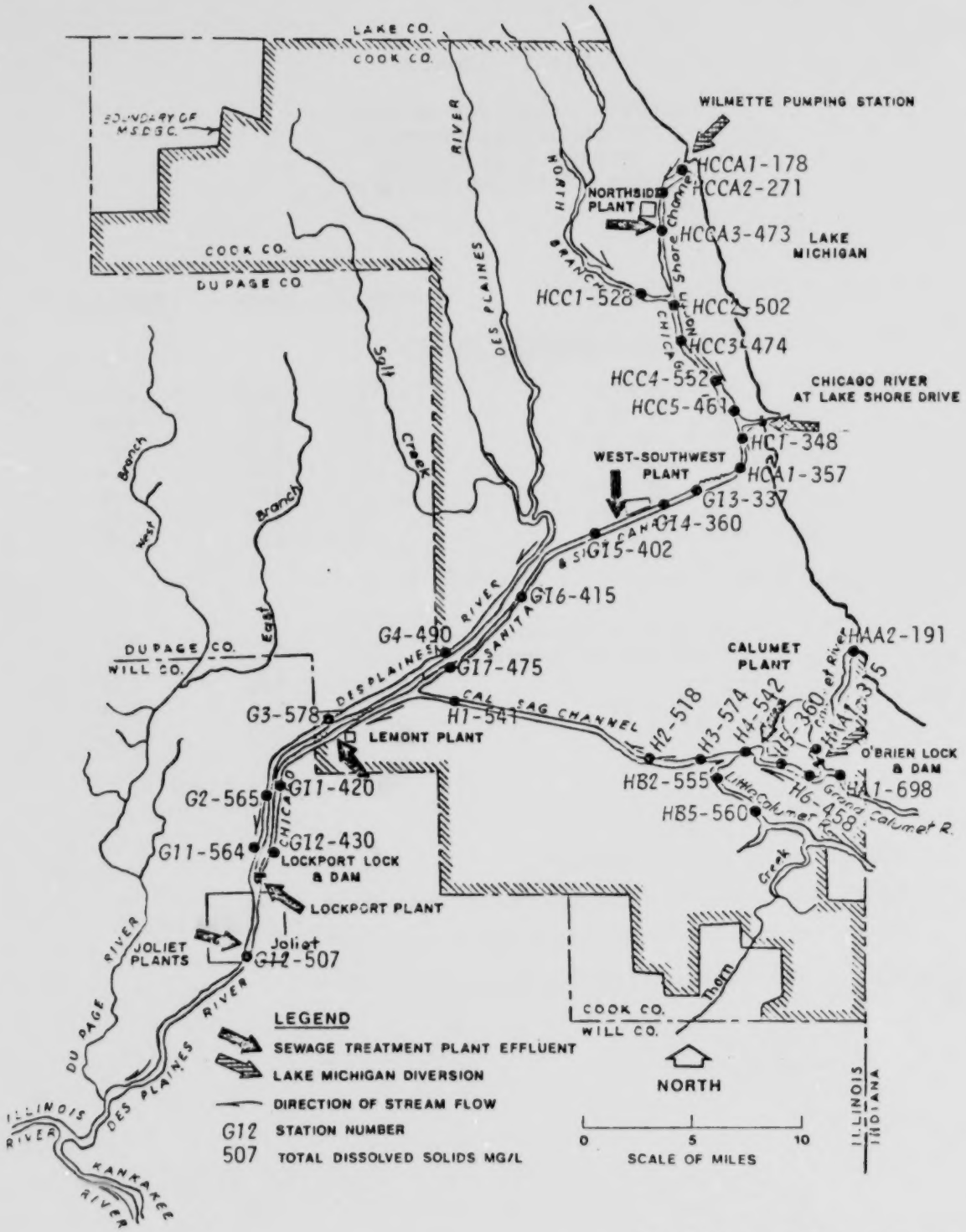
* General Use Waters

1/ No. of samples analyzed

2/ Total Dissolved Solids by Electrical Conductivity

3/ Station Location Shown on Figure 1

Source: IEPA 1976 Monitoring Data



CHICAGO WATERWAY SYSTEM

AVERAGE TOTAL DISSOLVED SOLIDS
IEPA STATIONS, 1976
Figure 1

HARZA ENGINEERING COMPANY
APRIL 1978

Table 2

TOTAL DISSOLVED SOLIDS
IN SECONDARY CONTACT
WATERS DURING 1976
MSDGC MONITORED STATIONS

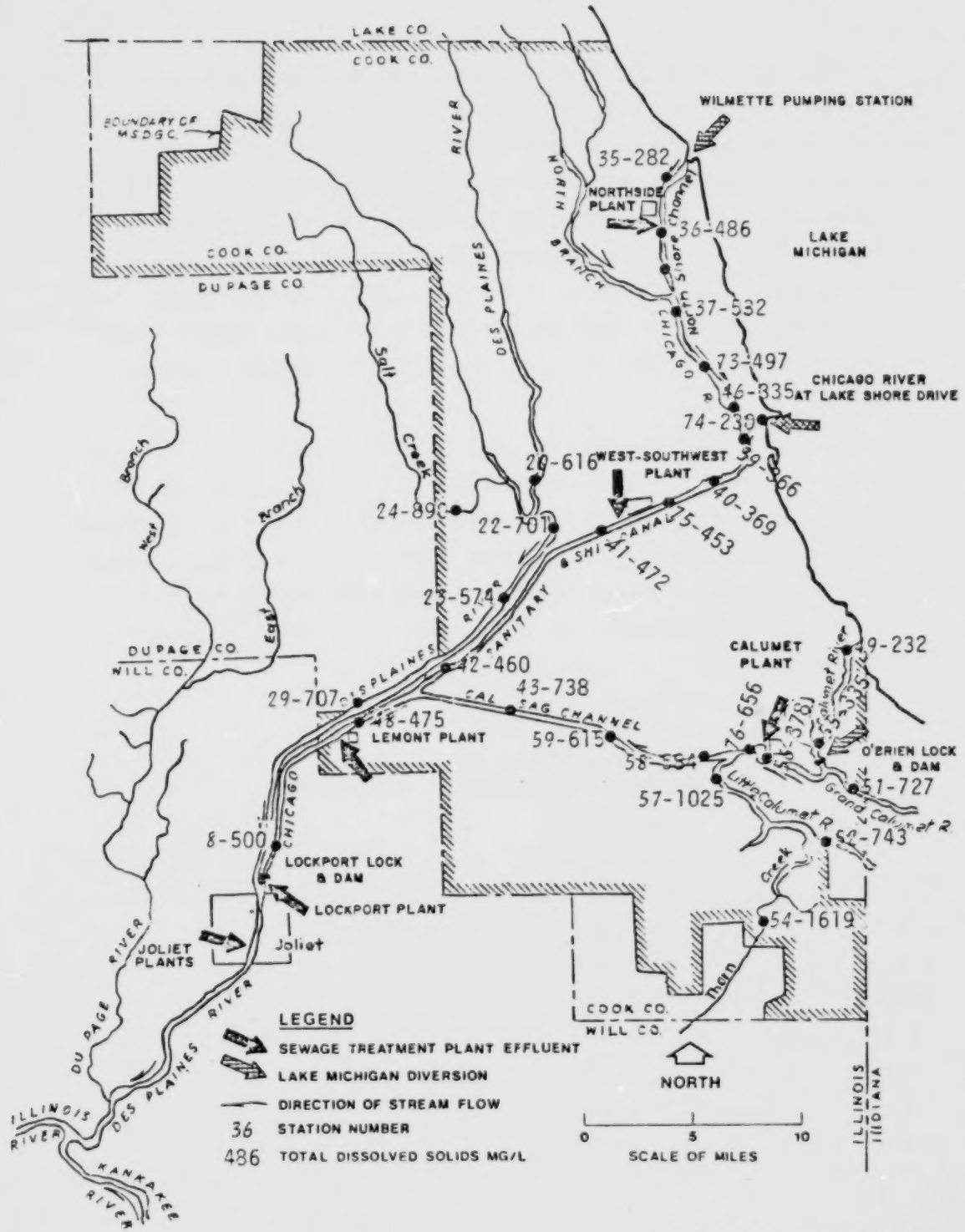
Water Quality Station[2]	No.[1]	TDS (MG/L) Mean	Maximum
Chicago Ship & Sanitary Canal			
75 Cicero Ave.	11	453	1131
41 Harlem Ave.	11	472	600
42 HWY 83	11	460	574
48 Lemont Bridge	10	475	609
8 16th St. Bridge, Lockport	10	500	669
Calumet Sag Channel			
58 Ashland Ave.	12	584	714
59 Cicero Ave.	12	615	806
43 HWY 83	11	738	1917
Calumet River			
49 92nd & Ewing Ave.	12	232	472
55 130th St.	11	335	583
56 Indiana Ave.	8	378	571
Grand Calumet River			
51 IMB R.R. Bridge	11	727	889
Little Calumet River			
76 Halsted Ave.	12	656	816
52* Wentworth Ave.	11	743	1476
57* 135th & Ashland	11	1025	1490
54* Joe Orr Rd., Thorn Creek	12	1619	2092
North Shore Channel			
35 Lincoln St.	9	282	538
36 Touhy St.	11	486	904

Water Quality Station[2/]	No.[1/]	TDS (MG/L) Mean	Maximum
North & South Branch, Chicago River			
37 Wilson Ave.	11	532	833
73 Diversy Ave.	11	497	671
46 Grand Ave.	11	335	590
39 Madison St.	11	366	487
40 Damen Ave.	11	369	709
DesPlaines River			
20* Roosevelt Rd.	9	616	825
22* Ogden Ave.	10	701	1019
23* Willow Spring Rd.	8	574	904
29* Lemont Stephens St.	7	707	966
24* Wolf Rd., Salt Creek	10	890	1285

* General Use Waters

1/ No. of Samples Analyzed
2/ Station Location Shown on Figure 2

Source: MSDGC 1976 Monitoring Data



CHICAGO WATERWAY SYSTEM

AVERAGE TOTAL DISSOLVED SOLIDS
MSDGC STATIONS, 1976
Figure 2

HARZA ENGINEERING COMPANY
APRIL 1978

Under the existing regulations the TDS concentrations monitored in the secondary contact waters are within the water quality standard if the limitation of 3500 mg/l is used as a criterion. With the amended regulations the TDS standard of 1000 mg/l would be violated in the Chicago Sanitary and Ship Canal, Calumet Sag Channel, North Shore Channel, and Grand Calumet River, as indicated by MSDGC data. Enforcement of the proposed TDS standard would thus require control of TDS sources entering secondary contact waterways.

The major effects of TDS on aquatic life are by direct toxicity and osmotic stresses. The toxicity of TDS varies with the concentration of individual solids and the synergistic and antagonistic effects they have on each other. Toxic levels of several compounds, which are components of total dissolved solids, presented in a previous study[3], are shown in Table 3.

Table 3

TOXICITY LEVELS OF INORGANIC COMPOUNDS FOR BLUEGILL AND DIATOM

Compound	96-hr TL_m for Bluegill mg/l	120-hr TL_m for Diatom Nitzschia Linearis, mg/l
$CaCl_2$	10,650	3,130
$CaSO_4$	2,980	3,200
NaCl	12,946	2,430
Na_2SO_4	13,500	1,900
Na_2CO_3	320	242
$NaHCO_3$	8,600	650
KCl	2,010	1,337

Sorenson et al[5] from their review of dissolved solids on freshwater biota indicated that only occasionally do dissolved solids have drastic acute effects on the biology of most freshwater systems. Effects of dissolved solids are usually subtle, seldom serving to completely eliminate biological systems in stream. Limiting concentrations of total dissolved solids for osmotic stresses on freshwater fish are not definitely known, but they have been reported[6] to range from 5000 to 10,000 mg/l depending on species and prior acclimatization. The National Technical Advisory Committee[7] recommended that innocuous dissolved materials should not exceed 50 milliosmoles (the equivalent of about 1500 mg/l sodium chloride) in waters where a diversified aquatic population is to be protected. The U.S. EPA Quality Criteria for Water[8] does not set any specific standard for dissolved solids but recommends criteria for chlorides and sulfates in domestic water supplies. McKee and Wolf[6] concluded from a literature review that dissolved solids of up to 2000 mg/l, 2500 mg/l, 700 mg/l, and 1000 mg/l should not interfere with the beneficial use of water for fresh-water fish and aquatic life, stock watering, irrigation, and domestic water supply, respectively.

Secondary contact waters are protected for secondary contact uses and support of indigenous aquatic life. Secondary contact waters in and around the Chicago metropolitan area receive a large fraction of their base flow as treated wastewaters and suffer considerable degradation as a result of urban stormwater runoff and combined sewer overflows. A biological survey of the Little Calumet River and the Chicago Sanitary and Ship Canal was conducted by the IEPA in 1973 and indicated polluted conditions with the presence of

pollution tolerant organisms or no organisms at all. The pollution control programs in the metropolitan area are anticipated to improve water quality of secondary contact waters and result in an improved aquatic life.

Toxic Substances

Secondary contact waters receive a large portion of their base flows from municipal and industrial wastewater treatment facilities. The potential for presence of exotic toxic substances in these discharges is great. However, the type and extent of toxic substances discharged into secondary contact waters and their impacts on aquatic life are not known. Such substances might contribute to the degradation of secondary contact waters and could limit the enhancement of water quality in the future.

Dilution Ratio Definition

The amendment to the definition of dilution ratio would not result in an adverse impact on aquatic life. The amended definition would permit treatment facilities with intermittent or controlled discharges to meet less stringent effluent criteria for BOD_5 and suspended solids. The applicable effluent criteria for such facilities would be either 30 mg/l BOD_5 and 30 mg/l suspended solids or 20 mg/l BOD_5 and 25 mg/l suspended solids, depending on the magnitude of the wasteload. The treatment facilities would discharge only when the flow in the receiving stream is at least five times the flow of wastewater effluent. Treatment facilities with effluent limitations of 4 mg/l BOD_5 and 5 mg/l suspended solids based on a dilution ratio of less than one to one could also benefit by discharging when the dilution ratio is equal to one to one or greater. The effluent requirements in this case could be changed to 10 mg/l BOD_5 and 12 mg/l

suspended solids. The discharges from these facilities will also have to comply with Rule 402 of the Water Pollution Rules and Regulations, which stipulates that the effluent by itself or in combination with other discharges would not cause a violation of any applicable water quality standards.

The loading rate of BOD_5 and suspended solids will be higher if the effluent standards for a treatment plant are relaxed under the proposed regulation. The increase in BOD_5 loads could depress dissolved oxygen levels in the receiving stream below the levels expected under the current regulations. However, by maintaining the dilution ratio the change is not expected to affect aquatic life significantly. The additional load of suspended solids will increase the amount of solids that can settle to the bottom of the receiving stream. This change is also expected to have no discernible effect on aquatic life.

Implementation Plan Changes

The changes in the Implementation Plan will not have any environmental consequences.

Chapter 4

BENEFITS

Identification of Impacted Population

Among the proposed amendments, the changes in the combined sewer regulations and the dilution ratio definition change would benefit an identifiable group of population. The changes in the combined sewer regulations could benefit approximately 4.7 million people served by combined sewers. The benefit to an individual would not be significant, but the municipalities serving the affected population would realize a saving as they would not be required to go through the variance procedure for sewer construction within combined sewer service areas. The dilution ratio definition change would benefit mainly rural population. Some of the 100 small treatment facilities serving a total of approximately 250,000 people can utilize controlled discharge facilities and comply with less stringent effluent requirements. This would result in less costly treatment facilities and lower operation and maintenance costs, which could reduce the sewer charges.

Nature and Valuation of Benefits

The benefits of the proposed amendments vary from those related to the enhancement and protection of the beneficial uses of waterways to savings to the public, municipalities and industries. The significant ecological, health, recreational and aesthetic benefits resulting from some of the proposed amendments are identified in the Benefit Assessment Worksheet (Appendix B). Benefits from changes that will simplify or eliminate the administrative procedures are identified in terms of cost savings. Major benefits from each category of proposed changes are discussed below.

Sewer and Sewage Definition Changes

The proposed change in the definition of sewer will further the intent of the act in continuing to provide the same level of protection to natural watercourses as any other waters of the state. The amended definition would allow a conveyance to be classified as a "sewer" only if it was designed for the purposes of transporting wastewater or land runoff. Natural watercourses that are used to transport both wastewater and runoff will be clearly excluded. This would minimize litigation to resolve the status of these natural watercourses.

Combined Sewer Regulations Changes

These changes do not have any appreciable ecological, recreational or aesthetic benefits. The only major benefit is reduction in cost to individuals or municipalities involved in construction and/or rehabilitation of sewers in combined sewer service areas.

Under the existing Rule 602(a), construction or rehabilitation of combined sewers requires the individual or municipality involved to go through a set of procedures summarized in Table 4, to get a variance from the rule. First, a petition for variance is filed with IEPA and the clerk of the IPCB. The IPCB has to give notice of the petition. The IEPA reviews and investigates the petition and makes its recommendation to the IPCB within 30 days. The IPCB may authorize a public hearing regardless of the IEPA's recommendation. However, if the IEPA or anyone else files a written objection to the petition, the IPCB must authorize a public hearing. Notice of the variance hearing must be given to the petitioner, any objector, and those on the IPCB's mailing list. After the public hearing, the petitioner must furnish to the IPCB

Table 4

COMPARISON BETWEEN PROCEDURES REQUIRED UNDER

RULE 602(a) AND PROPOSED AMENDMENT

	Under 602(a)		Amended 602(a)
1.	Application for Construction Permit	1.	Application for Construction Permit
2.	Petition for Variance Filed 1 copy with IEPA 10 copies with IPCB	2.	Evaluation of Project Impact on Collection System, Treatment Plant and Receiving Waters
3.	Notice of Petition Given By IEPA By IPCB	3.	IEPA's Decision: Permit Granted or Denied
4.	Review and Investigation of Petition by IEPA		
5.	Recommendation of Findings to IPCB by IEPA		
6.	If Hearing is Necessary, Notice of hearing by IPCB, Hearing and Transcripts of Hearing		
7.	IPCB's Decision With or Without hearing		

copies of complete transcripts of the proceedings of the hearing. The IPCB reviews the petition, the IEPA's recommendation, and the transcript if public hearing was held, and renders a final decision. The decision has to be rendered within 90 days after filing of the petition. The existing procedure thus results in a cost to the petitioner, IEPA, and IPCB, and a delay in carrying out the construction or rehabilitation program.

The major cost items to the petitioner include preparation of the petition, coordination with various agencies, preparation of drawings and supplementary information, and the administrative costs. If a public hearing is held, the fee of an attorney and the cost of transcripts are added to the above. The IEPA incurs costs for variance investigation, preparation of recommendation to IPCB, and administrative costs. With a public hearing the fee of an attorney is added to the total cost. The cost to the IPCB includes the cost of reviewing the petition and IEPA's recommendations, the cost of preparing the IPCB's opinion, and administrative costs. With a public hearing the IPCB also incurs the cost of a hearing officer and the cost of sending notices.

The cost to the petitioner for three variance procedures (PCB76-276, PCB77-122, and PCB77-215) ranged from $645 to $2480 without a hearing. The difference in the cost was mainly due to the complexity of the proposed construction work and the degree of coordination required. The additional cost of a public hearing to the petitioner is estimated to be $500. The cost to the IEPA is estimated to be $900 and $500 with and without a hearing, respectively. Similarly, the cost to the IPCB is estimated to be $335 and $150 with and without a hearing, respectively. The total cost for the

variance procedure to all three parties shown on Table 5 is estimated to be $3270 and $2185 with and without a public hearing, respectively.

Table 5

COST OF VARIANCE FROM RULE 602(a)

	With Hearing ($)	Without Hearing ($)
Petitioner*	2035	1535
IEPA	900	500
IPCB	335	150
Total	3270	2185

* Indicated cost is average of 3 variances investigated for the study.

During 1976 and 1977 twelve variances from Rule 602(a) were requested and processed by IEPA and IPCB, two of which were required to go to public hearing. Based on these data, it could be expected that, every year, on an average six petitions would be filed and processed, of which five would be disposed of without a hearing and one with a hearing. This would result in a total annual cost of about $14,000 to the petitioner, IEPA and IPCB (Table 6).

Table 6

ESTIMATED ANNUAL COST OF VARIANCES FROM RULE 602(a)

	With Hearing		Without Hearing	
	No. of Variances	$	No. of Variances	$
Petitioner	1	2000	5	7600
IEPA	1	900	5	2500
IPCB	1	300	5	700
		3200		10800

The proposed amendment would eliminate the need to obtain a variance for combined sewer construction in a designated combined sewer service area and would result in an annual saving of $14,000 to the three parties.

Secondary Contact Water Quality Standard Changes

The major benefits from the proposed changes are related to the ecology of secondary contact waters. The benefits from limiting toxic substances would be more significant, because of their lethal consequences, than those from limiting TDS. The health benefits are negligible as these waters are not intended for drinking water source nor primary recreation. The benefits of limiting TDS are also not significant for the power industry, the major user of secondary contact waters. The changes in total barium and total arsenic limitations, which are less restrictive than the existing regulation, would not result in any benefits since the effluent limitations for these substances remain the same.

Total Dissolved Solids. The proposed limitation would not have any significant immediate ecological benefits. The existing aquatic life in secondary contact waters consists of pollution tolerant forms. The enhancement of aquatic life in these waters is limited by existing physical and chemical conditions of the waters. Future benefits will depend on the species of aquatic life in these waters and the components of total dissolved solids. The existing concentrations of total dissolved solids, which occassionally exceed the proposed limitation, do not appear to be limiting or critical in supporting and enhancing the aquatic life of these waters.

Toxic Substances. The proposed standard would ensure that the control of toxic substances can be enforced under

state regulations. Such control would help to protect the indigenous aquatic life from toxic stresses.

To assess the potential of toxic substances in the wastewater discharges from industry, the 65 toxic substances identified by the U.S. EPA as priority toxicants were evaluated. Based on industry SIC codes and the information on the uses of these 65 toxic materials in manufacturing process, several industries in the Chicago metropolitan area could be using one or more of these toxic substances. However, it is not possible to determine from the available data if discharge of these substances in industrial waste flows is taking place. The proposed limitation would be utilized when more information becomes available. It should also be pointed out that the U.S. EPA is currently developing water quality criteria for these 65 toxic pollutants and will eventually develop effluent standards to control these substances.

Dilution Ratio Definition

The change in the definition of dilution ratio will benefit only those dischargers with effluent limitations based on Rule 404, Deoxygenating Wastes. Typical treatment facilities that can benefit from this change are:

1) Industrial wastewater treatment facilities with controlled discharge capability. These facilities are not widespread and only one case has been brought before the IEPA and the IPCB.

2) Domestic wastewater treatment facilities in rural areas where adequate land at a reasonable cost is available to provide storage of wastewater when streamflows are low.

3) Wastewater treatment facilities for treating area runoff generated during storm events, and subject to effluent limitations based on Rule 404.

Industrial Dischargers. Among the industrial dischargers of process wastewater, only one case has been identified which could benefit by this change. The Industrial Water Supply (IWS) Company at Ficklin, Illinois has applied to IEPA for a permit to operate its wastewater treatment facility with less stringent effluent limitations and regulated discharges. The IWS treatment facilities consist of 8 waste lagoons treating 3 mgd of industrial waste flow. The existing NPDES permit requires that the effluent meet the 10 mg/l BOD_5 and 12 mg/l suspended solids standards. These effluent standards are based on a dilution ratio of less than 1:1 and a "Pfeffer Exemption." The eight-stage lagoon treatment meets the existing effluent BOD_5 limitation during most of the year. However, during low ambient temperatures effluent BOD_5 concentrations in excess of 10 mg/l, but less than 20 mg/l, are reported. The IWS is proposing to utilize its treatment lagoons and other available storage facilities to store the wastewater when flow in the stream is low and BOD_5 in the effluent is in excess of 10 mg/l. The stored wastewater would be discharged when flow in the stream is adequate to provide 5:1 dilution. The IWS has on-site storage facilities of 137 to 183 million gallons that would provide storage for 46 to 61 days for 3 mgd waste flow. To meet the existing effluent limitations, IWS has indicated that it would have to construct additional treatment facilities at a capital cost of $3 million. The proposed change could thus make it possible for IWS and other industrial facilities with wastewater storage capability to utilize existing facilities and operate with less stringent effluent limitations.

Domestic Wastewater Dischargers. The operators of small wastewater treatment facilities with existing effluent requirements of 4 mg/l BOD_5 and 5 mg/l suspended solids, or 10 mg/l BOD_5 and 12 mg/l suspended solids could benefit from this change by providing storage and discharging only when the receiving stream flow is at least five times the effluent flow. Such facilities would then be required to meet the effluent criteria of 30 mg/l BOD_5 and 30 mg/l suspended solids. For storage facilities to be more economical than tertiary or advanced treatment, the municipalities will typically be rural with a population less than 5000. Communities with a population less than 2500 can apply for a "Lagoon Exemption" which permits effluent BOD_5 of 30 mg/l and suspended solids of 30 mg/l. However, this is contingent on meeting water quality standards during the 7 day-10 year low flow. The facility also has to be isolated so that, combined with other sources in the area, the untreated waste load has a population equivalent less than 2500.

At present about 41 wastewater treatment plants, each having a design flow between 0.25 and 0.5 mgd, have an effluent requirement of 4 mg/l BOD_5 and 5 mg/l suspended solids (Table 7). Due to the prohibitive cost of meeting this most stringent effluent requirement, IEPA has proposed a change in the regulation (R77-12) which would allow these facilities to meet the effluent requirement of 10 mg/l BOD_5 and 12 mg/l suspended solids. Another 64 treatment plants, with a "Pfeffer Exemption," have an effluent requirement of 10 mg/l BOD_5 and 12 mg/l suspended solids (Table 7).

To estimate the potential savings in treatment cost it is assumed that all the above treatment plants will be replaced within the next twenty years and will have effluent

requirements of 10 mg/l BOD_5 and 12 mg/l suspended solids. To meet the effluent criteria of 10 mg/l BOD_5 and 12 mg/l suspended solids, all the plants will have to be replaced with the equivalent of biological secondary treatment and tertiary filters. The estimated construction and annual operation and maintenance cost would be $97 million and $8.5 million, respectively. If these treatment plants are permitted to construct controlled discharge facilities to meet effluent criteria of 30 mg/l BOD_5 and 30 mg/l suspended solids, the estimated construction and annual operation and maintenance cost would be $57 million and $1.8 million, respectively. These costs are based on the facilities shown on Table 7, and the unit processes and the cost shown on Table 8.

The differences in construction cost of $40 million and annual operation and maintenance cost of $6.7 million represent an estimate of potential benefits of the proposed change in the definition of dilution ratio. Actual benefits will depend on the number of treatment plants that can utilize lagoons and the status of the existing facilities.

Area Runoff Treatment Facilities. The third category of waste treatment facilities that could benefit from the proposed change in the dilution ratio definition is the area runoff treatment facility. Such facilities collect and treat area runoff from bulk oil storage areas, railroad yards, and industrial and commercial yards and discharge to the receiving stream only during storm events.

The number, size, and the operation of area runoff facilities with effluent limitations based on Rule 404 are not readily identifiable from the NPDES data files. The benefits to such facilities will also vary depending on the size of the facility, frequency of discharge, and the flow

Table 7

ITEMIZATION OF WASTE TREATMENT FACILITIES IN ILLINOIS BY FLOW AND EFFLUENT REQUIREMENTS [1/]

Flow (MGD)	BOD_5/SS (mg/l) 4 / 5	BOD_5/SS [2/] (mg/l) 10 / 12	BOD_5/SS [3/] (mg/l) 30 / 30
0.251-0.300	15	23	5
0.301-0.350	3	2	1
0.351-0.400	8	13	3
0.401-0.450	3	3	-
0.451-0.500	12	23	-
Total	41	64	9

1/ Includes treatment plants with a design flow between 0.25 and 0.5 mgd.
2/ Treatment facilities with Pfeffer Exemption
3/ Treatment facilities with Lagoon Exemption

Source: IEPA Point Source Dischargers Data

Table 8

CAPITAL, OPERATION AND MAINTENANCE COST
FOR TWO ALTERNATIVE TREATMENT METHODS

Size in MGD	Controlled Discharge Facility[1] Capital Cost[3] ($)	Controlled Discharge Facility[1] O&M Cost[3] ($)	Tertiary Treatment Facility[2] Capital Cost[3] ($)	Tertiary Treatment Facility[2] O&M Cost[3] ($)
0.1	222,000	10,000	464,000	40,000
0.3	463,000	15,000	808,000	68,000
0.5	685,000	19,000	1,105,000	93,000

1/ Stabilization Ponds with 160-day storage and raw wastewater pumping.

2/ Prefabricated Contact Stabilization, raw wastewater pumping, sludge drying beds and rapid mixed media filters.

3/ Costs are valued in December, 1977 dollars. Cost Data Sources:

a) Patterson, W.L. and Barrker, R.F. Estimating Costs and Manpower Requirements for Conventional Waste Water Treatment Facilities, 1971.

b) Benjes, Jr., H.H. Small Community Wastewater Treatment Facilities - Biological Treatment System - U.S. EPA Technology Transfer Seminar, 1977.

in the receiving stream at the time of discharge and thus, has to be evaluated case by case.

Implementation Plan Changes

The proposed deletion of Rule 1001 and 1002 from IPCB's Rules and Regulations will eliminate the duplication of information and would, therefore, result in savings to the IEPA.

Rule 1001 requires the IEPA to submit to the IPCB an annual waste discharge report consisting of a list of waste dischargers, description of type, quantity and concentrations of various contaminants being discharged, description of existing and planned treatment controls, and the schedule dates for completion of treatment works. Most of this same information is now available in Phase I Basin Plans prepared by IEPA in accordance with Section 303 of the Federal Water Pollution Control Act and in 305(b) reports. Updated information on existing dischargers, addition of new dischargers, and the effluent data for all dischargers are maintained by the IEPA as part of an electronic data system. This information can be accessed on an as-needed basis. Thus, producing an annual report would mean duplication of existing information which is readily available to the IPCB and the public. Moreover to reproduce the existing data base of dischargers inventory, effluent and compliance schedule in a form of a report as required by Rule 1001 would necessitate modifications in the data access programs. Such a programming effort is estimated to cost initially $15,000. In addition, preparation and printing of a report would cost up to $5000 annually.

Rule 1002 requires owners and operators of wastewater treatment facilities to file with the IEPA a project completion schedule for modification or upgrading of facilities to

meet applicable effluent standards. The deadlines for filing these schedules have since passed and thus the existing rule is obsolete. The project completion schedules are now included as part of NPDES permits.

Chapter 5

COSTS

The proposed amendments are primarily definition clarifications, and would not have any adverse impacts on water quality. Thus, most of these changes would not result in costs associated with health, ecological, recreation, and aesthetic impacts. The major costs are treatment costs to comply with the changes in the level of specific pollutants allowed in the secondary contact waters. These costs and other related costs of each category of proposed changes are discussed below.

Sewer and Sewer Definition Changes

These changes, by providing the same level of protection to minor streams as to any other waters of the state, would result in control of pollutants being discharged to such waters to the extent that all applicable water quality standards are met. However, the treatment costs to facilities discharging to these streams should not be considered a consequence of the proposed amendment. As pointed out earlier, the intent of the act has always been (demonstrated in the decision of the IPCB in Stephan Chemical v. EPA, PCB 74-270 amd Alton Box Board v. EPA, PCB 74-51) to treat minor streams and watercourses as any other waters of the state. The proposed change would not add any cost beyond what is already required by the existing rules and regulations.

Combined Sewer Regulations Changes

The proposed change would not result in any additional cost to the dischargers. The conveyance facilities which were designed as separate sanitary sewers but came to be used as combined sewers due to inflow, will be explicitly

defined as separate sewers under the proposed change. The overflows from such sanitary sewers will have to be controlled. However, similar control measures have been required under the existing regulation; and thus, the cost of controlling overflows cannot be attributed to the proposed change.

Secondary Contact Water Quality Standard Changes

The proposed standard of total barium and total arsenic is higher than the existing effluent limitations and thus no additional treatment costs would be incurred. However, the proposed changes in the concentration of total dissolved solids, and the toxic substances limitation could affect the dischargers of these pollutants.

The potential costs of controlling and monitoring toxic substances cannot be assessed at this time as the nature and the concentrations of these discharges are not known.

The current concentrations of TDS in the secondary contact waters occassionally exceed the proposed water quality standard of 1000 mg/l, as indicated by the MSDGC data. Controlling sources of TDS that contribute to these concentrations which exceed 1000 mg/l could result in cost to eliminate the occasional violation of the proposed standard. The continuous point sources of TDS discharge to secondary contact waters which include the industrial and municipal wastewater treatment plants do not appear to be contributing to the occasional increases of TDS above 1000 mg/l. The other sources, which include the non-point sources and TDS in tributaries to secondary contact waters, appear to be responsible for these ocassional increases. The cost of controlling the non-point sources cannot be assessed as the nature and extent of contribution from these sources cannot be evaluated from the existing data.

The major point source dischargers of total dissolved solids shown in Table 9 are currently under the 1000 mg/l level and thus would not cause a violation of the proposed standard. Only two treatment facilities, Union Oil Co. and Rexene Polymer Co., have a total dissolved solids concentration in their discharges greater than 1000 mg/l. Rexene Polymer Co. discharges to the Des Plaines River at Joliet and the Union Oil Co. discharges to the Chicago Sanitary and Ship Canal at Lemont. Rexene Polymer Co. and Union Oil Co. add about 1800 and 34,000 lb/day TDS, respectively, to the receiving waters. This is negligible compared to the load of 6.5 million lb/day that would be carried in the Chicago Sanitary and Ship Canal and Des Plaines River at the 7 day-10 year low flow with the maximum TDS level recorded. The 7 day-10 year low flow of receiving waters in both cases is close to 1100 MGD. The maximum observed concentrations of total dissolved solids in the Des Plaines River at Joliet and Chicago Sanitary and Ship Canal at Lemont are 700 and 609 mg/l, respectively. These two dischargers would raise the TDS level in the receiving waters from 700 to 703 mg/l, an increase of less than one-half percent.

Among the municipal dischargers monitored for total dissolved solids, the MSDGC's treatment plant at Calumet has the highest average and maximum concentrations. The discharges from the Calumet treatment plant contribute significantly to total dissolved solids in the Calumet river system. The Calumet treatment plant receives part of its wasteflow from steel industries. These steel industries handle their process wastewater through a closed loop recycle

Table 9

TOTAL DISSOLVED SOLIDS DISCHARGERS
TO SECONDARY CONTACT WATERS
(IEPA EFFLUENT DATA 1975-1977)

	Receiving Stream Flow[1] (MGD)	Treatment Plant Flow[2] (MGD)	N	TDS/EC[3] (MG/L) AVG	MAX
MSDGC-West Southwest 001	284.9	866.0	7	535	680
Reynolds Metals 001	0	1.43	3	326	410
Universal Oil Co, Lemont	0	0.14	1	630	
Reynolds Metals 002	0	0.42	2	300	420
Reynolds Metals 003	0		2	560	670
Union Oil Co, Lemont	1111.7	3.00	3	1353	1830
Texaco Loeport AND02	1098.2	15.10	1	430	
MSDGC Calumet 001	32.5	214.0	8	734	820
Inter Natl Har-Wis Steel		57.0	4	263	340
U.S. Steel So. Wks 006		20.0	3	237	260
Interlake Steel Coke 003		9.4	3	287	390
Republic Steel 001		21.0	2	330	410
Republic Steel 004		30.0	3	327	440
Republic Steel 002		43.0	1	200	-
Republic Steel 003		14.3	3	331	440
Interlake Riverdale 002	170.0	1.1	1	560	-
Interlake Riverdale 003	170.0	4.3	1	580	-
Interlake Riverdale 004	170.0	5.8	1	560	-
Interlake Riverdale 005	170.0	8.6	1	570	-
MSDGC-North Side 001	18.7	330.0	3	550	680
Rexene Polymers Co.	1186.1	0.085	6	2586	3330
US Steel-Joliet Wks 001		29.90	3	577	710
GAF Corp	1156.9	-	8	683	800

1/ 7 day - 10 year Low Flow

2/ Average Flow During 1977

3/ Total Dissolved Solids by Electrical Conductivity for TDS concentrations of 750 mg/l or less

Source: IEPA Point Source Dischargers Data and IEPA 1975-1977 Effluent Data

system and discharge the blowdown to the treatment plant. It was contended in the public hearing held for the proposed rules and regulation amendments[9] that the proposed level of total dissolved solids would place restrictions on the steel industry recycle systems. This will not occur in the foreseeable future.

Currently four of the five steel industries which discharge blowdown to the treatment plant, are recycling 100 percent of their process flow. The fifth steel plant is partially recycling its process flow but is planning a closed loop system with 100 percent recycling of all process flow. The flow and the concentration of total dissolved solids in the blowdown of the five steel industries are shown in Table 10. An additional blowdown of 0.5 MGD is projected from Wisconsin Steel, when the closed loop system for the blast furnace process water becomes operative.

The concentration of TDS from the Calumet sewage treatment plant can be increased by 180 mg/l without causing a violation of the proposed standard. This increase translates to an allowable increase of 322,000 lbs/day of TDS. Current TDS loads of the steel industry are about 142,000 lbs/day. It appears that an increase of TDS discharge from these steel industries of about 2 times the current TDS load would not contribute to the violation of the proposed standard. Current and potential TDS loads from the MSDGC Calumet sewage treatment works are presented in Table 11.

The non-point sources and particularly urban runoff during winter months also contribute total dissolved solids to secondary contact waters. Street runoff from melting ice and snow mixed with chloride salts is discharged to nearby receiving streams through combined sewer overflows, treatment

Table 10
STEEL INDUSTRY BLOWDOWN DISCHARGE TO
CALUMET SEWAGE TREATMENT WORKS

	Average Flow (mgd)	Average Specific Conductivity Micromhos/cm	Average TDS/EC[1] (mg/l)	lbs/day
Interlake Inc.				
Chicago Plant	3.1	2000	1200	31,000
Riverdale	2.6	6500	3900	84,000
U.S. Steel	3.4	625	375	10,600
Republic Steel	4.0	-	300[2]	10,000
Wisconsin Steel	1.4	-	500[2]	5,800

1/ Total TDS calculated by multiplying specific conductivity in micromhos by 0.6.

2/ Concentrations of TDS is assumed, based on the data of similar process water.

Source: Personal Communication with Steel Industries and MSDGC

Table 11

TOTAL DISSOLVED SOLIDS LOADS,
MSDGC CALUMET SEWAGE TREATMENT WORKS

	lb/day
Existing Average Discharge at Maximum TDS Level-820 mg/l	1,463,000
Existing Average Discharge at Average TDS Level-734 mg/l	1,310,000
Total Discharge at 1000 mg/l and Existing Average Flow of 214 mgd	1,785,000
Total Discharge at 1000 mg/l and Design Flow of 220 mgd	1,835,000

plant discharges and storm sewers. Street runoff samples collected from a section of the Kennedy Expressway in downtown Chicago with a drainage area of 101.8 acres in the winter of 1967 showed chloride contents from 11,000 to 25,000 mg/l during periods of snowfall[10].

Huff and Huff[3] from their analysis of TDS data for the Des Plaines River indicated that approximately 50 miles of this river has a TDS level greater than 1000 mg/l occasionally. The concentrations above 1000 mg/l were reported to occur primarily in the month of January and February, when run-off containing salts from the roads takes place. Wulkowiz and Saleem[11] collected over 600 water samples from 11 creek sites within the Salt Creek Basin during the winter of 1972-1973 and reported concentrations of chloride ranging from 35 to 1530 mg/l. Their analysis also indicated that 62% of the applied road salt chloride was removed by the creek during the study period.

A study[12] on the effects of street deicing salts, on waters of the Chicago River System, concluded that the salt content of the runoff water following street deicing had a noticeable impact on the water quality of the North Shore Channel, the Chicago River, and the Chicago Sanitary and Ship Canal. The concentrations of sodium and chloride in the above waterways were reported to increase significantly during post-salting runoff periods.

The IEPA and MSGDC data for TDS in secondary contact waters collected during 1975 and 1976 indicate that the higher concentrations generally occur during winter months.

The MSDGC data also indicate that one of the observations that exceeded 1000 mg/l was monitored after a significant snow fall in the area. Similarly, another observation

monitored in the spring, which also exceeded 1000 mg/l, coincided with a precipitation event in the area.

The above data and the review of related studies indicate that the non-point sources and particularly the runoff from street deicing could contribute to violation of the proposed TDS standard. However, the frequency of these violations and the degree of TDS contribution from road salting cannot be evaluated from the existing data.

Dilution Ratio Definition

The amended definition of dilution ratio would allow treatment facilities with intermittent discharges to meet less stringent effluent standards. This would not result in any additional cost, to the dischargers.

The amended definition will not have significant costs associated with environmental or health effects. The facilities with intermittent or controlled discharges will be required to meet all applicable water quality standards for the receiving waters.

Implementation Plan Changes

The changes in the Implementation Plan will not result in any costs.

Chapter 6

COMPARISON OF BENEFITS AND COSTS

The main benefit of the proposed amendments is clarification of the language and the intent of the act. This would aid in enforcement of the rules and regulations and would also reduce the number of litigations related to interpretations of rules and regulations. Other additional benefits are protection of beneficial uses of water, and savings in costs to the individuals, muncipalities, industry and the state. The costs of the proposed changes are mainly limited to treatment and monitoring costs to comply with some of the proposed changes. The savings and treatment costs are quantified in dollar terms, whereas the significant environmental consequences are identified and discussed. The major costs and benefits for each category of amendments are discussed below.

Sewer and Sewage Definition Change

The amended definition of sewer will further the intent of the act by restricting the classification of sewer to only those conveyance facilities designed and built to convey wastewater and runoff. Natural watercourses would be excluded and would continue to be provided the same level of protection as any other waters of the state. With an explicit definition, the dispute about the status of such watercourses would be resolved and litigation on such matters minimized.

The amended definition of sewer will require treatment facilities that discharge to natural watercourses to either eliminate the discharges or provide treatment to meet all applicable water quality standards. However, the costs of these controls should not be considered as a consequence of

this change, as such control actions have been required under the existing regulations.

Combined Sewage Regulations Changes

The definition of "combined sewer" under these changes is made explicit. The amended definition of combined sewer would also further the intent of the act and minimize litigation on such matters.

The addition of a new definition of "Combined Sewer Service Area" and the amendment to Rule 602(a) would eliminate the need to acquire a variance from IPCB to rehabilitate, extend or construct a new sewer in a designated combined sewer service area. This would result in savings to IEPA, IPCB, and the owner of the sewers. The total saving is estimated to be $14,000 annually with a major portion of it benefitting the owner of the sewers.

The construction of relief sewers and new sewers within a combined sewer service area would not add significant flow to the existing overflows. Thus, these sewers would not have discernible adverse impacts on the receiving waters.

Secondary Contact Water Quality Standards

The proposed changes would clarify the applicable standards of several chemical constituents for secondary contact waters. All the constituent concentrations in the proposed amendment, except for total arsenic, total barium and total dissolved solids, are the same as required by existing rules and regulations. Total barium and total arsenic are being increased from the existing level to make it consistent with the general use waters. The total dissolved solids level in secondary contact waters is to be limited to the same level as that required for general use waters.

The benefits of the proposed changes and the addition of a toxic substance limitation in secondary contact waters are mainly limited to aquatic life. Because these waters are not used as a source of drinking water or for primary recreation, the benefits related to health are not significant. However, these waters flow into the general use waters and the proposed limitations would thus protect general use waters.

The type and concentrations of toxic substances discharged into secondary contact waters and their impact on aquatic life are not known. The proposed standard for toxic substances would ensure that control of toxic substances can be enforced when these substances and their impacts on aquatic life are identified. Such controls would minimize acute toxic stress on indigenous aquatic life.

The existing concentrations of TDS in secondary contact waters occassionally exceed the proposed 1000 mg/l standard as indicated by MSDGC data. However, limiting TDS to 1000 mg/l in these waters would not result in significant immediate benefits. The existing aquatic life in secondary water consists mainly of pollution tolerant forms. The enhancement of aquatic life in these waters is limited by existing physical and chemical conditions of the waters.

The potential cost of the proposed changes will be associated with reduction of toxic substances and total dissolved solids to meet the proposed limitations. The cost of toxic substances control cannot be assessed because the presence and concentrations of these substances in the discharges are unknown. The control cost will probably be incurred without this regulation as U.S. EPA is establishing effluent standards for an initial list of 65 toxic pollutants.

The main sources of total dissolved solids are the municipal and industrial discharges, urban runoff, and TDS in waters tributary to the secondary contact waters. All of the identified municipal and industrial dischargers of total dissolved solids except two, would not violate the proposed water quality standard because their existing effluent concentration is lower than 1000 mg/l. The two treatment facilities with more than 1000 mg/l of total dissolved solids in their effluents discharge to receiving waters with adequate flow and lower background levels so that a violation of the proposed standard could not be attributed to these two sources. Thus, control of total dissolved solids from municipal and industrial sources does not appear to be necessary to comply with the proposed limitation. The concentrations of TDS that occasionally exceed the proposed 1000 mg/l appear to be due to non-point sources and TDS in tributaries to the secondary contact waters. The cost of controlling the non-point sources of TDS to secondary contact waters cannot be assessed as the nature and degree of contribution of these sources cannot be evaluated from the existing data.

Dilution Ratio Definition

The main benefit of this change is savings in treatment cost to one industry, to owners and operators of small domestic wastewater treatment facilities, and owners of area runoff facilities with effluent requirements based on Rule 404. The proposed change would allow treatment facilities, with controlled discharges, to comply with less stringent effluent requirements. The potential saving to one industry, which would use its existing facilities to control its discharges, is estimated to be $3 million in capital cost.

The benefit to small domestic wastewater treatment facilities would depend on the number of facilities which can utilize controlled discharge alternative to the existing tertiary treatment requirement. The savings to these are estimated to be up to $40 million in capital cost and $6.7 million in annual operation and maintenance cost.

There are no significant environmental consequences expected from this change. The facilities with controlled discharges will be required to meet all applicable water quality standards for the receiving water.

Implementation Plan Changes

The deletion of an existing rule requiring an annual report from IEPA would eliminate the duplication of information and result in savings to the IEPA. The savings are estimated to be $15,000 in initial investment and $5,000 annually.

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APPENDIX A

PETITION FOR AMENDMENTS TO WATER POLLUTION REGULATIONS AND JUSTIFICATIONS

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STATE OF ILLINOIS)
) SS:
COUNTY OF SANGAMON)

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

RECEIVED
MAY 10 1977
POLLUTION Control Board

AMENDMENTS TO THE WATER POLLUTION REGULATIONS OF THE ILLINOIS POLLUTION CONTROL BOARD	)	R77- 12

PETITION FOR AMENDMENTS TO
WATER POLLUTION REGULATIONS

The Illinois Environmental Protection Agency (Agency) pursuant to Section 1004 of the Illinois Environmental Protection Act (Ill. Rev. Stat., ch. 111 1/2, Sections 1001 et seq., 1975) (Act) hereby petitions the Illinois Pollution Control Board (Board) to amend certain of the Water Pollution Regulations (Chapter 3) as follows:

I. DEFINITIONS

Amend the definitions of Combined Sewer, Dilution Ratio, Primary Contact, Sewage, Sewer, and Wastewater contained in Rule 104 of Chapter 3 and add the definitions Combined Sewer Service Area and Sludge to Rule 104, the amended definitions and additions to read as follows:

"Combined Sewer" means a sewer designed and constructed to receive ~~receiving~~ both wastewater and land runoff;

"Combined Sewer Service Area" means a specific geographical drainage area served entirely by a combined sewer system. Areas served by separate sewer systems which enter the combined system are not included. Undeveloped areas within a combined sewer service area may be included in that area if deemed appropriate by the Agency;

Language to be deleted is interlined; proposed language is underlined.

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"Dilution Ratio" means the ratio of the seven-day once in ten year low flow of the receiving stream or the lowest flow of the receiving stream when effluent discharge is expected to occur, whichever is greater, to the average ~~dry-weather~~ flow of the treatment works for the design year;

"Primary Contact" means any ~~recreational or other~~ water use ~~in which there is~~ of a prolonged and intimate ~~contact~~ nature ~~with the water~~ (such as swimming and water skiing) such that there is a ~~involving~~ considerable likehood ~~risk~~ of ingesting ~~water in~~ significant quantities of water ~~sufficient to pose a significant health hazard such as swimming and water skiing~~;

"Sewage" means water-carried human and related wastes from any source ~~together with associated land runoff~~;

"Sewer" means a conveyance or system of conveyances constructed and operated for the purpose of collecting and transporting ~~pipe or conduit for carrying either~~ wastewater or land runoff, or both;

"Sludge" means the accumulated solids and any associated liquid resulting from the treatment of wastewater, but does not include livestock manure or septic tank sludges generated from domestic sources;

"Wastewater" means sewage, sludge, industrial waste, or other waste, or any combination of these, whether treated or untreated, plus any admixed land runoff;

II. ANALYTICAL TESTING

Amend Rule 105, Analytical Testing, the amended Rule to read:

105 Analytical Testing

All methods of sample collection, preservation, and analysis used in applying any of the requirements ~~rules and regulations~~ of ~~in~~ this Chapter shall be in accord with USEPA's current manual of practice or with other procedures acceptable to USEPA and the Agency. ~~those prescribed in "Standard Methods for the Examination of Water and Waste Water," Thirteenth Edition, or with other generally accepted procedures.~~

III. BACTERIA AND DISINFECTION

Delete Rules 203(g) and 205(d) and amend Rule 405 for fecal coliform, the deleted and amended Rules to read:

203 General Standards

The General Standards listed below will protect the State's water for aquatic life, agricultural use, primary and secondary contact use, and most industrial uses, and ensure the aesthetic quality of the State's aquatic environment. Except as otherwise provided in this Chapter, all waters of the State shall meet the following standards:

. . .

(g) Deleted

~~(g) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number 31616) shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30-day period, exceed 400 per 100 ml.~~

205 Secondary Contact and Indigenous Aquatic Life Standards

Waters designated in Part III of this Chapter for Restricted Use shall meet the following standards:

(d) Deleted

~~(d)--Based-on-a-minimum-of-five-samples-taken-over-not-more-than a-30-day-period,-fecal-coliforms-(STORET-number---31616)-shall-not exceed-a-geometric-mean-of-1,000-per-100-ml,-nor-shall-more-than-10%-of the-samples-during-any-30-day-period-exceed-2,000-per-100-ml.~~

405 Bacteria

No effluent from any source which discharges to the following locations shall exceed 400 fecal coliforms per 100 ml:

(a) Within 20 stream miles (32.26 kilometers) upstream of a public bathing beach licensed by the Illinois Department of Public Health under the "Illinois Swimming Pool and Bathing Beach Act" (Chapter 111 1/2 Ill. Rev. Stats. 1977, Paragraph 1201-1227). This limitation applies only during the months of May through September.

(b) Within 20 stream miles (32.26 kilometers) upstream of a water intake used for public or food processing water supply.

(c) To any location where it may cause or contribute to violation of another state's water quality standards in interstate waters.

~~405--Bacteria~~

~~No-effluent-governed-by-this-Part-shall-exceed-400-fecal coliforms-per-100-ml-after-July-31,-1972-except-that-effluent-discharges to-the-Ohio-and-Mississippi-Rivers-shall-meet-this-requirements-by December-31,-1973.~~

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IV. WATER QUALITY STANDARDS (SECONDARY CONTACT)

Amend Rule 205(e) for effluent standards for secondary contact and indigenous aquatic life waters to read:

205 Secondary Contact and Indigenous Aquatic Life Standards

Waters designated in Part III of this Chapter for Restricted Use shall meet the following standards:

. . .

(e) Concentrations of other chemical constituents ~~substances~~ shall not exceed the following ~~applicable effluent~~ standards: ~~prescribed in Part IV of this Chapter.~~

Constituent	Storet Number	Concentration (mg/l)
Ammonia Nitrogen (as N)	00610	2.5 (April - October) 4.0 (November - March)
Arsenic (Total)	01002	1.0
Barium (Total)	01007	5.0
Cadmium (Total)	01027	0.15
Chromium (Total Hexavalent)	01032	0.3
Chromium (Total Trivalent)	01033	1.0
Copper (Total)	01042	1.0
Cyanide	00720	0.025
Fluoride (Total)	00951	15.0
Iron (Total)	01045	2.0
Iron (Dissolved)	01046	0.5
Lead (Total)	01051	0.1
Manganese (Total)	01055	1.0
Mercury (Total)	71900	0.0005
Nickel (Total)	01067	1.0

Oil (Hexane Solubles or Equivalent)	00550, 00556 or 00560	15.0
Phenols	32730	0.3
Selenium (Total)	01147	1.0
Silver	01077	0.1
Zinc (Total)	01092	1.0
Total Dissolved Solids	70300	1000

V. TOXIC SUBSTANCES

Add Rule 205(g), the new Rule to read:

(g) Any substance toxic to aquatic life not listed in Rule 205(e) shall not exceed one half of the 96-hour median tolerance limit (96-hour TLm) for native fish or essential fish food organisms.

VI. DEOXYGENATING WASTES

Delete Rule 404(f), 404(f) to read:

404(f) Deleted

~~(f)--Except as provided in paragraphs (d) and (e) of this Rule 404, on or after December 31, 1973, no effluent whose dilution ratio is less than one to one shall exceed 4 mg/l or BOD_5 or 5 mg/l of suspended solids, except as follows:~~

~~(i)---Sources employing third stage treatment ingredients shall be exempt from this paragraph (f), provided all of the following conditions are met:~~

~~(ii)--Other sources not within paragraphs (d) and (e) of this Rule 404 shall be exempt from this paragraph provided all of the following conditions are met:~~

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~~(A)--The effluent shall not, alone or in combination with other sources, cause a violation of any applicable water quality standard; and~~

~~(B)--The effluent shall not, alone or in combination with other sources, cause dissolved oxygen in the waters of the State to fall below the levels set by the applicable water quality standards.~~

~~(C)--The effluent shall not exceed 10 mg/l of BOD, or 12 mg/l of suspended solids; and~~

~~(D)--The owner or operator of such source shall file with the Agency the Project Completion Schedule required by Rule 1002 of this Chapter. In addition to the requirements of Rule 1002, such schedule shall include a program for achieving compliance with the above conditions and with applicable water quality standards, including, but not limited to, dissolved oxygen, bottom deposits, ammonia nitrogen, and phosphorus, with particular reference to nitrogenous oxygen demand and to the control of storm water overflows; and~~

~~(E)--The Agency finds that the program will assure compliance with the conditions of this subparagraph within the compliance dates otherwise applicable.~~

VII. MERCURY REPORTING

Delete Rule 501(b) and renumber Rule 501(c) accordingly, the Rules to read:

501 Reporting Requirements

. . .

~~(b) Every person within this State who utilizes mercury or any of its compounds in excess of 15 pounds per year as Hg shall file with the Agency, on or before June 1, 1971 and annually thereafter, a report setting forth the nature of the enterprise, a list, by type and by quantity of mercury products and mercury derivatives produced, used in, and incidental to its processes, including by-products and waste products, the estimated concentrations and annual total number of pounds of mercury that will be discharged into the waters of the State or that will be discharged into any sewer system, and what measures are taken or proposed to be taken to reduce or to eliminate such discharges.~~

(b) ~~(c)~~ Every holder of an NPDES Permit is required to comply with the monitoring, sampling, recording and reporting requirements set forth in the permit and this Chapter.

VIII. COMBINED SEWERS

Amend Rule 602(a), the amended Rule to read:

602 Combined Sewers and Treatment Plant Bypasses

(a) The expansion of existing or establishment ~~installation~~ of new combined sewers service areas is prohibited, except where sufficient retention or treatment capacity is provided to ensure that no violation of the effluent standards in Part IV of this Chapter occurs.

IX. DISPOSAL OF WASTES FROM WATERCRAFT

Amend Part VIII of Chapter 3 by the addition of Rule 803, the new Rule to read:

803 Statewide Application

The Rules in this Part apply to all waters of the State unless preempted under Section 312 of the FWPCA.

X. SLUDGE DISPOSAL

Amend Subpart B of Part IX by the addition of Rule 950, the new Rule to read:

950 Permits For Sites Receiving Sludge

(a) Construction and operating permits are required for all sites receiving sludge unless:

(1) The sites receive sludge from a treatment works or pretreatment works having a valid Agency operating or NPDES permit with a sludge handling scheme approved by the Agency;

(2) The sludge users apply the sludge to a site of less than 200 contiguous acres under common ownership or control; and

(3) The sludge is applied at the site in compliance with Agency application criteria;

(b) Notwithstanding compliance with Rule 950(a) for the purposes of sludge application without a permit, the Agency may under special circumstances require sites receiving sludge to obtain a permit. Such a permit may be required when the Agency determines that compliance with Rule 950(a) may not be adequate to protect the environment or the public health. In making such a determination, the Agency shall consider the following factors:

(1) Whether the sludge is being stored at a site other than at the generating treatment plant or pre-treatment works or in the transporting vehicle;

(2) The proposed rate and application method of the sludge onto the receiving site;

(3) The quality (constituents and concentrations) of the sludge to be applied to the receiving site;

(4) The geological and hydrological characteristics of the receiving site including proximity to waters of the State; and,

(5) Whether the public health may be threatened by sludge application at the receiving site.

XI. IMPLEMENTATION PLAN

Delete Part X (Implementation Plan), the deleted Part to read:

Part X: Deleted

~~Part Xa - Implementation Plan~~

~~This part requires an annual waste discharge report to be prepared by the Environmental Protection Agency and provides for the filing and approval of programs to meet future conditions.~~

~~Part Xb - Waste Discharge Report~~

~~The Agency shall annually prepare and submit to the Board a Waste Discharge Report which lists the waste discharges in the State, describes the type, quantity and characteristics of the wastes contributed by the sources, and identifies the receiving waters and describes the existing and projected conditions therein and the existing plans for compliance of treatment requirements.~~

~~1002-Project-Completion-Schedule~~

~~(a)--Any-person-who-owns-or-operates-any-sewer-treatment-works or-wastewater-source-that-requires-modification-or-additional-controls to-meet-any-applicable-effluent-standard-contained-within-this-Part shall-file-a-Project-Completion-Schedule-with-the-Agency.--The-Project Completion-Schedule-shall-include-a-description-of-the-wastewater source,-the-contaminants-to-be-controlled,-the-additional-controls-or treatment-required,-and-a-time-schedule-for-the-project's-completion which-must-meet-the-applicable-deadlines,-as-well-as-interim-dates-by which-various-increments-of-the-proposed-compliance-program-shall-be completed,-such-as-dates-when-plans-and-specifications-shall-be-completed,-dates-when-contracts-will-be-awarded,-dates-for-equipment delivery,-and-dates-for-the-commencement-of-construction.--The-approval by-the-Agency-of-a-Project-Completion-Schedule-and-compliance-therewith shall-constitute-a-prima-facie-defense-to-any-enforcement-action respecting-the-requirements-whose-compliance-the-program-is-designed to-achieve,-during-the-period-of-the-program~~

~~(b)--Project-Completion-Schedules-shall-be-filed-in-accordance with-the-following-timetables~~

~~(i)----For-compliance-with-rules-201-and-202,-the-schedule shall-be-filed-no-later-than-July-1,-1973~~

~~(ii)---In-other-cases-in-which-compliance-with-additional controls-is-to [illegible] the-schedule-shall-be filed-no-later-than-July-1,-1974~~

~~(iii)--Where-compliance-with-effluent-standards-is-required at-a-date-later-than-December-31,-1973,-the-schedule-shall-be filed-no-later-than-December-31,-1972.~~

~~(iv)---For-compliance-with-the-combined-sewer-deadlines-set by-Rule-602(d)(2)-and-(3),-the-schedule-shall-be-filed-no-later than-July-15,-1973.~~

~~(c)--Failure-to-adhere-to-an-approved-compliance-schedule-shall constitute-a-violation-of-this-Part-for-which-appropriate-sanctions may-be-sought-in-accordance-with-the-Act.~~

The Agency's statements of the reasons supporting each of its proposals are presented in the attached document entitled "Justifications."

Respectfully submitted,

Barbara Lidke
Barbara N. Lidke
Senior Technical Advisor
Enforcement Programs

Dated: May 9, 1977

BNL:mh/rgb-2

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

AMENDMENTS TO THE WATER POLLUTION)
CONTROL REGULATIONS OF THE ILLINOIS) PCB R77-
POLLUTION CONTROL BOARD)

RECEIVED
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POLLUTION CONTROL BOARD

JUSTIFICATIONS

The Agency, pursuant to Procedural Rule 203(b), hereby submits its statements of the reasons supporting each of its proposals and of the purpose and effect of each proposal.

I. DEFINITIONS

The reasons in support of the proposed changes in Rule 104, Definitions, are either related to changes in substantive proposals or are intended to clarify vague or ambiguous language. The reasons are summarized below:

Combined Sewer There are a number of communities in Illinois that have sewer systems that were designed as separate sanitary sewers but receive significant amounts of surface runoff as a result of attachment of catch basins. There have been requests to the Agency to consider these systems as combined sewers. The sewers are clearly unable to handle the storm flows that are generated and the catch basins should be moved from the sanitary sewers and routed to the storm water handling facilities. The proposed language would restrict the definition of "combined sewer" to only those systems originally designed to contain both wastewater and land runoff.

Combined Sewer Service Area: This new definition is supported as part of the Agency proposal (Part VIII) to allow the installation of new combined sewers which serve presently served by combined sewer systems which can only discharge. For further discussion, the Board is referred to Part VIII of the Justifications.

Dilution Ratio: There have been a number of cases before the Pollution Control Board (for example, Industrial Water Supply v. EPA, PCB 76-207) in which the petitioner has proposed a system that would only discharge when there was adequate flow in the receiving stream to assure a predetermined dilution ratio. This type of operation is intended to allow a higher deoxygenating waste effluent standard under Rule 404. The Agency has interpreted the requirements of Rule 404 to apply to a dilution ratio of the receiving stream at seven day - ten year low flow to the design average dry weather flow of the treatment facility. This interpretation poses two basic problems:

1. The type of facility described above would not be permitted.
2. Facilities designed to treat only wastewater generated during storm events must be able to comply with the Rule 404 standard determined on the basis of a dilution ratio calculated at 7 day - 10 year low flow regardless of the flow of the receiving stream when discharge is actually expected to occur. An example of this type of facility is a treatment plant designed to treat contaminated runoff from railroad switch yards, industrial loading areas, and similar problems.

The proposed language would resolve these problems and clarify the Board's intent.

Primary Contact: The existing definition of "Primary Contact" seems to suggest that ingestion of primary contact water, no matter how slight, poses "a significant health hazard." The proposed language retains the intent of the definition and removes the ambiguity.

Sewage: The removal of the reference to land runoff from the definition of "sewage" eliminates a certain amount of confusion.

The term "wastewater" includes both "sewage" and "land runoff". This term is used whenever combined sewage is discussed.

Sewer: This term has caused a great deal of controversy both within and outside the Agency. The Board's decisions in the Alton Box Board case involving "Shields Branch" (PCB 73-61, August 19, 1974) and Modine Manufacturing (PCB 74-14, October 17, 1974) point out the need for a revision to the existing definition. A broad interpretation of the reference to both "wastewater" and "land runoff" coupled with a liberal definition of "conduit" could result in the classification of practically all waters in Illinois as sewers. The proposed language would allow a conveyance to be classified a "sewer" only if it was designed for the purpose of transporting wastewater or land runoff. Natural watercourses would be more clearly excluded.

Sludge: This new definition is proposed as part of the Agency's proposal for establishing a system to regulate the disposition of sludges on land (Part IX of these proposals).

Wastewater: The Agency proposes to add the term "sludge" to the definition of "wastewater" in connection with its Part X proposal.

II. ANALYTICAL TESTING

The proposed change to Rule 203 of Chapter 3, which will require compliance with NEEFA procedures, is intended to make certain that the analytical testing procedures which dischargers are required to follow pursuant to their NPDES permits and the analytical testing procedures required pursuant to Chapter 3 are fully consistent with each other.

III. BACTERIA AND FLUORIDATION

The Agency proposes to delete the water quality standards for fecal coliform (Rules 203(g) and 203(i)) because, in its opinion, the provisions

of fecal coliform bacteria in waters is not a reliable indicator of contamination or unacceptability for primary contact use. Fecal coliform are often present as a result of natural causes and their presence does not predict or correlate with the incidence of waterborne illness among swimmers or other users.

The Agency further proposes to modify the effluent standard for fecal coliform (Rule 405) to require disinfection of effluents only (1) upstream from beaches during the swimming season (May through September); (2) upstream from intakes for public or food processing water supplies (year-round); and (3) to locations where the discharge may cause or contribute to violations of another state's water quality standards in interstate waters (year-round).

The Agency's proposals are based on its findings and its review of the relevant literature with respect to the need for disinfection of effluents and the cost and environmental impact of chlorination. The Agency will provide testimony at the hearings on this proposal in suppot of the following points:

1. Chlorine is not only toxic to aquatic life and a potential heath hazard but may also be ineffective in reducing pathogenic organisms.

2. No technologically feasible and economically reasonable alternatives to chlorination for disinfection presently exist.

3. Almost no documented occurrences of illness associated with ingestion of treated (but unchlorinated) sewage have been found by the Illinois Department of Public Health since records have been kept. But have such occurrences been reported in the literature. The Department of Public Healt supports the Agency proposal and has stated that it will testify in favor of it at hearings.

4. Fecal coliform is a very poor indicator of the presence of pathogens and cannot assure the safety of waters for primary contact use.

The proposed regulation does provide for the continued disinfection of point sources that would directly affect heavily used recreational areas and public and food processing water supply intakes or might cause a violation of the water quality standards of another state.

IV. WATER QUALITY STANDARDS (SECONDARY CONTACT)

The secondary contact water quality standards set forth in Rule 205 of Chapter 3 were adopted by the Pollution Control Board for the purpose of preventing nuisance conditions occuring in waters designated for this use. In its adopting opinion on March 7, 1972, (3 PCB 755, 764) the Board stated in part:

> "...aquatic life standards for various toxic materials need not be met since these waters (secondary contact) are not protected to assure against nuisance conditions, and, to protect other waters downstream...."

To assure that downstream waters were protected, the existing Rule 205(e) was adopted to incorporate the effluent standards of Part IV as water quality limits for secondary contact waters.

The effluent standards of Chapter 3 (Part IV) contain not only concentration levels for a number of parameters but certain conditions under which those limitations are applicable. This causes confusion as to what water quality standards apply to secondary contact waters. The rules that cause the most difficulty are:

A. Rule 404. Is it the intent of the Board to limit BOD_5 and organic suspended solids when Rule 205(e) establishes a dissolved oxygen standard? If it is the intent to limit deoxygenating waste levels as water quality

parameters, which of the 404 levels was intended? The Agency feels that BOD_5 and suspended solids are inappropriate as water quality standards. BOD_5 is not an indicator of water quality but rather a means for predicting the impact of a given waste on the dissolved oxygen of the receiving stream. Suspended solids levels are so variable in all receiving streams due to resuspension of sediment caused by velocity fluctuation that routine monitoring provides little information on water quality. The added variability caused by heavy barge traffic on most of the identified secondary contact streams makes monitoring of suspended solids of doubtful value.

B. Rule 406. Was it the Board's intent to establish an ammonia water quality standard for secondary contact waters? The Agency believes that a water quality standard is appropriate to assure that:

1. Downstream waters are protected, and

2. Toxic stress on indigenous aquatic life is minimized so that nuisance fish kills do not occur, and

3. Dissolved oxygen depletion due to nitrogenous oxygen demand is minimized.

C. Rule 408(b). What was the intended level of total dissolved solids for secondary contact waters (750 mg/l or 3500 mg/l)? The reference to "background concentration levels" in the rule causes great confusion. The Agency believes that some TDS limitation is desirable because grossly elevated levels may cause toxic stress on indigenous aquatic life. The general use water quality standard (1000 mg/l) would provide a reasonable level of protection. None of the Agency water quality network monitoring stations on secondary contact waters indicated TDS levels over 900 mg/l during calendar year 1976.

The Agency's proposed modifications to Rule 203(e) will identify in a tabular form a combination of our understanding of the Board's intended

water quality standards and changes that are necessary to assure the level of protection needed for secondary contact waters. There are six differences between the table that appears in proposed Rule 205(e) and the table in the present Rule 408(a). They are:

1. An ammonia nitrogen standard reflecting the levels in Rule 406 is included. (See the discussion of Rule 406 included above.)

2. The arsenic (total) standard in Rule 408 is lower than the general use requirements of Rule 203. The number that appears in proposed Rule 205(e) is the general use water quality standard.

3. The barium (total) limit was changed for the same reason as arsenic (to make the secondary contact and general use water quality standards consistent).

4. The pH limit was deleted since it is covered in Rule 205(b).

5. A total dissolved solids limit is included that reflects the general use standard. (See the discussion of Rule 408(b) included above).

6. The total suspended solids limit was deleted for the reasons set forth in the discussion of Rule 404 included above.

No BOD_5 or organic suspended solids limits for secondary contact waters are recommended by the Agency (see discussion of Rule 404 above).

There are a number of changes to the Part IV effluent standards of Rule 408 now pending before the Board (R76-21). Should these changes be adopted, Rule 205(e) should also be modified to reflect these changes.

V. TOXIC SUBSTANCES (SECONDARY CONTACT)

The Agency believes that some mechanism for the limitation of toxic substances in the secondary contact waters other than those listed in proposed Rule 205(e) is necessary. The proposed new Rule 205(g) would establish a water quality level of one half of the [illegible] for constituents not listed elsewhere in Rule 205. This would

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1. Minimize acute toxic stress on indigenous aquatic life that might cause nuisance fish kills, and

2. Minimize impact on downstream general use waters.

VI. DEOXYGENATING WASTES

The Agency proposes that the existing Rule 404(f) be deleted. The standard imposed by that Rule (4 mg/l BOD and 5 mg/l suspended solids) requires a level of treatment well beyond the capabilities of conventional tertiary treatment. Carbon adsorption appears to be the only possible means for compliance and results in extremely high capital and operating costs.

The Agency will submit evidence at hearing on this proposal to support the following points:

1. The prohibitive cost of providing carbon adsorption has not been reduced since the adoption of Rule 404(f) in 1972. Nor has any other economically reasonable process been developed that can produce effluent quality of 4 mg/l BOD and 5 mg/l suspended solids consistently within the averaging allowances of Rule 404(h).

2. The analytical procedures available for testing BOD_5 and suspended solids at the 4/5 level are quite inaccurate. In fact, an analytical error of 100 percent may be expected.

3. The so-called Pfeffer exemption and lagoon exemption procedures /(Rules 405(f)(i) and (ii)/ present problems. The Agency has developed and is using a stream modeling technique which works for a wide variety of streams but not for all receiving bodies of water. In particular, it is inapplicable to lakes or to streams ponded behind dams. Dischargers to quiet waters are faced with a multitude of modeling problems, requiring extensive field work, in

order to gain relief from the 4/5 standard. The Agency believes that such an extraordinary modeling effort is beyond the capability of most dischargers and probably beyond the capability of the Agency.

If the proposed change is adopted, a maximum limit of 10 mg/l for BOD and 12 mg/l for suspended solids would be established for discharges to low flow streams (less than one-to-one dilution ratio). However, pursuant to Rule 402, dischargers would be required to demonstrate compliance with water quality standards. In the case of deoxygenating wastes the demonstration could be made by following the procedures which the Agency has been using for granting Pfeffer and lagoon exemptions (Technical Policy WPC-1).

If the discharger is unable to make the demonstration in that manner due to modeling problems, the Agency would require the discharger to take the following steps:

(a) New sources would be required to divert the discharge to a location where the problem does not exist unless they secure a variance from Rule 962(a), Standards for Issuance, of Chapter 3.

(b) Existing dischargers would be required to evaluate alternatives--including diversion to a different basin, land application, etc. If the discharger demonstrates to the Agency that these alternatives are technically infeasible or economically unreasonable, the Agency will:

(i) Issue a permit allowing discharge at 10/12 for no more than two years;

(ii) Establish in the permit a monitoring program to determine the impact of the discharge on the receiving waters;

(iii) Evaluate the results of the monitoring program and when the permit expires require that the discharger take further action if necessary to prevent water quality violations. This action may include additional treatment, instream aeration, artificially induced dispersion or elimination of the discharge.

VII. MERCURY REPORTING

The Agency proposes to delete Rule 501(b) of Chapter 3, requiring users of mercury to file an annual report with the Agency.

The Agency has found, during the years in which the Rule has been in effect, that it is not an effective means for the control of mercury discharges into the waters, for the following reasons:

(a) The Rule itself places no limit on the use or discharge of mercury.

(b) The Agency has no effective method of verifying the data provided.

(c) Most users of mercury have apparently become sensitive to the environmental problems associated with its use. At any rate, the number of users and the amount used appear to have declined since the reporting requirement was instituted.

(d) The existing effluent and water quality standards provide effective means of control of the discharge of mercury into the waters of the State.

In summary, the Agency is of the opinion that the mercury reporting requirement is one reporting requirement which has served its purpose and can safely be abolished.

VIII. COMBINED SEWERS

The Agency proposes to amend Rule 602(a) of Chapter 3 to allow the installation of new combined sewers in areas which are presently served entirely by combined sewers (combined sewer service areas). The proposed amendment would not allow the geographical expansion of combined sewer service areas.

The Agency fully agrees with the original intent of Rule 602(a). Combined sewer overflow is a very serious problem and a major cause of water pollution downstream from older urban areas. Significant expansion of existing combined sewer systems and installation of new combined sewer systems results in a need for expensive, expanded treatment plants if additional pollutional load on receiving streams is to be avoided.

However, the language of the present Rule 602(a) prevents the construction of:

(a) replacement combined sewers;

(b) sewers designed to relieve hydraulic bottlenecks in existing combined sewer systems (so-called relief sewers);

(c) tap-ons of individual connections to existing combined sewers if these connections will contain storm water as well as sewage, thus sometimes requiring the installation of parallel sanitary and storm sewers which ultimately discharge into the same combined sewer (Springfield Convention Center v. EPA, PCB 76-247);

(d) extension of combined sewer service to unsewered pocket areas completely surrounded by a drainage area served by an existing combined sewer system (Mary Ann Nowak v. EPA, PCB 76-293).

The Agency believes that to allow construction of combined sewers under the circumstances described in (a) through (d) above will not significantly increase the total volume of combined sewage that the treatment facilities and interceptors must handle.

In the Agency's opinion the real purpose of Rule 601(a) was to prevent the expansion of combined sewers to new drainage areas--not to prevent the rehabilitation of existing systems or the taking of curative steps within combined sewer service areas so that wastewater is handled in the most expeditious manner without basement backups or street flooding.

The Agency will provide evidence in support of its position that its proposed modification of the prohibition against new combined sewers which is established by rule 602(a) will not have a significant adverse impact on water quality. If the Rule is modified as proposed the Agency will evaluate the potential impact of all permit applications for the construction of combined sewers within combined sewer service areas and if the proposed construction would cause or contribute to water pollution or to the violation of the Environmental Protection Act or other applicable regulations, the permit would, of course, be denied. The Agency seeks only to allow such construction, in limited areas, where the proposed construction will not affect water quality adversely.

IX. DISPOSAL OF WASTES FROM WATERCRAFT

The Agency is proposing additional language to Part VIII of Chapter 3, to make clear that these regulations do not apply where Section 312 of the Federal Water Pollution Control Act does apply.

Section 312(f)(1) states:

> After the effective date of the initial standards and regulations promulgated under this section, no State or political subdivision thereof shall adopt or enforce any standard or regulation of such State or political subdivision with respect to the design, manufacture, or use of any marine sanitation device or any vessel subject to the provisions of this Section.

The performance standards required to be promulgated by the Administrator of USEPA appeared in the Federal Register on January 29, 1976 (41 FR 4453) and appear at 40 CFR Part 140. The regulations concerning the design and construction and certification of marine sanitation devices were promulgated January 30, 1975 (41 FR 4622), amended twice, and appear at 33 CFR 159.

Under the applicable USEPA regulations, Coast Guard-certified marine sanitation devices, which allow discharge of sewage from vessels after treatment, may be used on: coastal waters and estuaries, the Great Lakes and interconnected waterways, freshwater lakes and impoundments assessible through locks, and other flowing waters that are navigable interstate by vessels subject to the regulation (40 CFR 1403).

The Agency's proposed language is intended only to point out that, pursuant to Section 312 of the FWPCA, the requirements of Rule 801 may be inapplicable to certain Illinois waters.

X. SLUDGE DISPOSAL

The Agency is submitting proposed Rule 950 in order to enable the Agency to establish a permit program to regulate the disposal on land of sludge from sewage treatment plants where site specific permit are necessary to protect the environment and to allow that activity without permit where it can safely be done.

Since the decision of the Board in Arnold May v. EPA, PCB 73-109, decided May 23, 1974, upheld on appeal by the Appellate Court of the Second District, 342 N.D. 2d 781, the Agency has assumed that disposal or utilization of sludge on land requires an Agency permit. This position is further supported by the provision in the Wastewater Land Treatment Site Regulation Act (Ill. Rev. Stat. 1975, Ch. 111 1/2, Section 583.05, which states:

> "No person may establish, operate, manage or maintain any wastewater land treatment site or any digested sludge utilization site without first obtaining a permit from the Illinois Environmental Protection Agency."

The word "sludge" does not appear anywhere in Chapter 3, and the authority of the Agency to regulate the disposal or utilization of sludge is implied in the definition of "wastewater" (Rule 104). The Agency believes that the addition of the word "sludge" as a defined term, and its inclusion in the definition of "wastewater," will serve to clarify the point.

The Agency has developed an approach to the problem of the proper utilization and disposition of sludge, under which certain sludge handling and disposal activities would require Agency permits and others, which meet certain specific criteria, would not. This approach will require amendment of the Wastewater Land Treatment Site Regulation Act; the Agency has prepared proposed legislation and it is under consideration by the General Assembly. It will also require amendment of Chapter 3, specifically authorizing the Agency to require permits for sites receiving sludge unless certain criteria are met and allowing such activity without permit if they are met.

Proposed Rule 950(a) will make clear that sites receiving sludge must do so under Agency permit unless:

(1) They receive sludge from a treatment works or pretreatment works which is operating under permit and which has developed a sludge handling scheme approved by the Agency; and

(2) The receiving site is under 200 acres; and

(3) The sludge is applied at the site in compliance with Agency application criteria.

The criteria which the Agency will use in its application of proposed Rule 950(a)(3) have been developed on a tentative basis and will be presented and explained during the course of the hearings on this proposal. In general, they deal with the type of sludge which may be applied, application rates, methods of storage, application methods, and other requirements for the environmentally acceptable application of sludge to land.

The Agency is of the opinion that in most cases application of sludge in accordance with the technical criteria which it has developed will be environmentally sound. However, under certain circumstances more detailed investigation and analysis of a sludge application scheme may be necessary. Therefore, the Agency proposes that it be given the authority to require site-specific permits, even for sites which meet the standards of proposed Rule 950(a) if it determines that further precautions are necessary. In such cases the Agency believes it should have the option of requiring the operator of the site to apply for a permit, describe in detail his proposed operation, and supply sufficient information for the Agency to make certain that no environmental hazard exists.

XI. IMPLEMENTATION PLAN AND WASTE DISCHARGE REPORT

The Agency proposes the deletion of Rule 1001, requiring the submission to the Board of an annual waste discharge report. The report submitted in prior years has rarely been consulted or used. Much of the same information is now also available in the Phase I basin plans prepared in accordance with Section 303 of the Federal Water Pollution Control Act, copies of which have been provided to the Board. Other information can be secured on an as-needed basis from the Agency's electronic data system, in which are maintained a discharge inventory and effluent data, and which will include NPDES permit compliance schedule data, showing expected completion dates for treatment plant improvements.

The Agency will be prepared to show at hearing the cost of preparing the annual report required by Rule 1001 and the resources by which essentially the same information can be made available to the Board and the public.

The Agency also proposes the deletion of Rule 1002, which required the filing with the Agency of a project completion schedule by persons required to modify or upgrade treatment facilities to meet applicable standards. The deadlines for filing project completion schedules have long since passed; the Agency has in its possession many cubic feet of boxes of such schedules, most of which are inaccurate or superseded, and none of which have been consulted for years.

The Agency is of the opinion, and will testify at hearing on this proposal, that the purposes originally intended to be served by the filing of project completion schedules have been and will continue

to be served by the compliance programs included in dischargers' NPDES permits. The requirement for a project completion schedule is no longer of use and should be deleted from the Board's active regulations.

Respectfully submitted,

ENVIRONMENTAL PROTECTION AGENCY

By: Barbara Sidler
Barbara Sidler
Senior Technical Advisor
Enforcement Programs

BS:sv/Spl-15

Date: May 9, 1977

APPENDIX B

ASSESSMENT WORKSHEET

ASSESSMENT WORKSHEET
CROSS-CHECKLIST FOR BENEFIT CONSIDERATIONS
economic impact study

B-1

ALTERNATIVE ASSESSED Secondary Contact Water Quality Standard Changes

DESCRIPTION Total Dissolved Solids Limited to 1000 MG/L

REGULATION NO. # 205(e) IEQ PROJECT NO. _____ TITLE: Economic Impact of Proposed Amendment, R77-12

BENEFIT CATEGORIES	LEVEL OF INFORMATION							EMPLANATORY REMARKS
	QUALITATIVE BENEFIT ASSESSMENT	REFERENCE	QUANTITATIVE BENEFIT ASSESSMENT					
			AMOUNT of BENEFIT	UNITS of MEASURE	RANGE of BENEFIT UNCERTAINTY	$ VALUE	RANGE of $ UNCERTAINTY	
1. Health Physiological	500 mg/l or more act as bladder and intestinal irritants.	6						Benefits not significant for secondary contact waters as not used for water supply source. Will protect downstream general use waters.
	Laxative Effects principally from sodium sulfate and magnesium sulfate	8	NS					
	Adverse effect of sodium on certain patients afflicted with cardiac disease and woman with toxemia associated with pregnancy.							

BENEFIT CATEGORIES	LEVEL OF INFORMATION							EMPLANATORY REMARKS
	QUALITATIVE BENEFIT ASSESSMENT	REFERENCE	QUANTITATIVE BENEFIT ASSESSMENT					
			AMOUNT of BENEFIT	UNITS of MEASURE	RANGE of BENEFIT UNCERTAINTY	$ VALUE	RANGE of $ UNCERTAINTY	
2 Biotic	Osmotic stress: Should not exceed 50 milliosmoles (equivalent of 1500 mg/1 Nacl)	7	LS					Existing levels lower than those recommended by McKee & Wolf (6).
	Toxicity: varies with components of TDS Influence toxicity of heavy metal due to antagonistic and synergistic effects.	6 & 7						
3 Aesthetic	Greater than 500 mg/l-water unpalatable	6	NS					Not used for drinking water source

BENEFIT CATEGORIES	LEVEL OF INFORMATION							EMPLANATORY REMARKS
	QUALITATIVE BENEFIT ASSESSMENT	QUANTITATIVE BENEFIT ASSESSMENT						
		REFERENCE	AMOUNT of BENEFIT	UNITS of MEASURE	RANGE of BENEFIT UNCERTAINTY	$ VALUE	RANGE of $ UNCERTAINTY	
4 Industrial/ commercial	High concentrations accelerate corrosion and in combination with calcium and alkalinity increases scaling in condensor cooling system, Can cause foaming in boilers and interfere with clearness, color, or taste of many finished products.	6	NS					Major use is cooling water for power plant. In secondary contact water major components of TDS expected to be sodium and chloride during winter months when high concentration occurs.
5. Agriculture	Under 700 mg/l, suitable under almost all conditions; 700-2100 mg/l, suitability dependent on soil, crop, climate; over 2100 mg/l unsuitable under most conditions.	6	NS					No significant use of secondar contact waters for irrigation

NS=Not Significant
LS=Less Significant

Appendix to Chapter 4

Controlled Discharge Facilities

Stabilization lagoons with long-term storage has been shown to be a suitable method of meeting the minimum secondary treatment standards for small rural communities. Information on installations in Michigan[1/] which practice controlled discharge indicates that the system with relatively low organic loads, long storage periods, and twice yearly discharge holds promise of meeting the requirement for secondary treatment. The effluent data collected for 49 lagoons during discharge periods indicated that there was a ninety percent probability that the effluent BOD_5 concentration from a 2 cell or more cell lagoon system would not exceed 27 mg/l. However, the 90 percent probability for effluent suspended solids concentration was 46 mg/l for a 2 cell lagoon system and 47 mg/l for a 3 cell lagoon system.

A similar study of controlled discharge lagoon system in Minnesota[1/] indicated that the effluent concentrations, during the fall discharge, for BOD_5 and suspended solids were less than 26 mg/l and less than 30 mg/l, respectively for 36 or 39 installations sampled.

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1 E. J. Middlebrook, etal., Upgrading Wastewater Stabilization Ponds to Meet Now Discharge Standards. Symposium Proceedings, PRWG 159-1. Utah State University, 1974.

POTENTIAL TOXIC SUBSTANCES USAGE IN MANUFACTURING INDUSTRIES

SIC	No. of Establishments in Cook & Will Counties[1]	Potential Usage of Number of Toxic Substance in Manufacturing Process[2]
2095	7	3
2261	6	1
2514	25	1
2522	6	1
2647	3	1
2649	19	1
2651	29	1
2821	10	3
2834	37	16
2841	33	4
2842	51	32
2844	46	12
2851	90	28
2879	7	2
2861	20	5
2891	38	9
2899	75	9
2893	33	1
2952	15	2
2992	26	5
3069	39	6
3079	354	4
3111	12	2

POTENTIAL TOXIC SUBSTANCES USAGE IN MANUFACTURING INDUSTRIES

SIC	No. of Establishments in Cook & Will Counties[1/]	Potential Usage of Number of Toxic Substance in Manufacturing Process[2/]
3141	5	1
3231	40	8
3411	18	2
3432	9	6
3461	286	6
3496	66	1
3641	4	10
3651	29	6
3652	17	7
3692	2	5
3842	39	2
3861	65	5
3911	28	1
3931	28	2
3952	7	8
3961	10	3
3999	113	4

1/ County Business Patterns, 1975. U.S. Department of Commerce, Bureau of the Census.

2/ Includes only 65 compounds identified by USEPA as priority toxic pollutants. Use in manufacturing industry based on; "Water Pollution Potential of Manufactured Products", EPA-73-179a/c/d.